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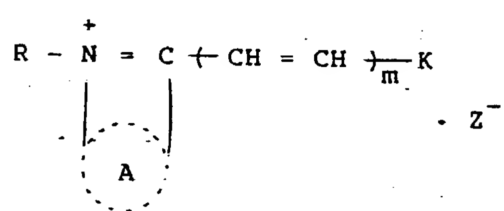
(54) **Optical recording medium.**

(57) An optical recording medium is disclosed, comprising a support having provided thereon a recording layer containing a naphtholactam dye represented by formula:



wherein K represents a substituted or unsubstituted aromatic amine residue; R represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted allyl group; Z^- represents an anion; ring A represents a substituted or unsubstituted naphthalene ring; and m represents 1 or 2. The recording layer can be formed by coating easily, has a high reflectance to provide a satisfactory contrast of recording, and exhibits excellent resistance to light.

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OPTICAL RECORDING MEDIUM

This invention relates to an optical recording medium. More particularly, it relates to an optical recording medium whose recording layer has a high reflectance and can be formed easily.

Optical recording media using a laser beam, etc. including laser discs are capable of recording and preserving informations at high densities and reproducing the recorded informations easily.

Laser discs generally comprise a disc base having provided thereon a thin recording layer, on which a laser beam condensed to a diameter of about 1 µm is irradiated to carry out high-density recording. Upon absorption of energy of the irradiated laser beams, the recording layer undergoes thermal changes, such as decomposition, evaporation, dissolution, and the like to thereby make a difference in reflectance between the irradiated areas and the non-irradiated areas. Reproduction of the recorded informations can be carried out by reading the difference of reflectance.

Therefore, in order to effect high-density recording and precise reproduction, optical recording media are required to show efficient absorption of a laser beam having a specific wavelength used for recording and to highly reflect a laser beam having a specific wavelength used for reproduction.

Various structures are known for this type of optical recording media. For example, Japanese Patent Application (OPI) No. 97033/80 (the term "OPI" as used herein refers to a "published unexamined Japanese patent application") discloses a support having provided thereon a single layer of phthalocyanine dyes. However, phthalocyanine dyes have disadvantages, such as low sensitivity, high decomposition points which lead to difficulty in vacuum deposition, and very low solubility in organic solvents which lead to difficulty in coating for formation of the recording layer.

Japanese Patent Application (OPI) Nos. 83344/83 and 22479/83 disclose phenalene dyes and naphthoquinone dyes, respectively, to be coated as a recording layer. These dyes, though easy to evaporate in vacuo, show low reflectances. Low reflectances result in poor contrast in reflectance between the recorded areas and non-recorded areas, thus making it difficult to reproduce the recorded informations.

In addition, Japanese Patent Application (OPI) Nos. 24692/84, 67092/84, and 71895/84 disclose recording layers comprising cyanine dyes. The cyanine dyes have an advantage of easy coating but are inferior in light resistance and undergo deterioration due to light for reproduction.

One object of this invention is to provide an optical recording medium whose recording layer can be formed by coating easily.

Another object of this invention is to provide an optical recording medium whose recording layer has a high reflectance to provide a satisfactory contrast of recording.

A further object of this invention is to provide an optical recording medium having excellent resistance to light, particularly light for reproduction.

As a result of extensive investigations, it has now been found that the above objects can be accomplished easily by providing a recording layer containing a naphtholactam light-absorbing dye having a specific chemical structure.

The present invention relates to an optical recording medium comprising a support having provided thereon a recording layer containing a naphtholactam light-absorbing dye represented by formula (I):

$$R - \overset{+}{N} = C \left(CH = CH \right)_m K \cdot Z^- \qquad (I)$$

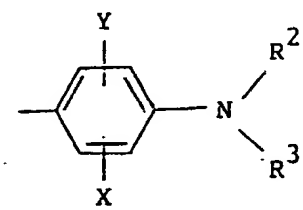
A

wherein K represents a substituted or unsubstituted aromatic amine residue; R represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted allyl group; Z^- represents an anion; ring A represents a substituted or unsubstituted naphthalene ring; and m represents 1 or 2.

In formula (I), substituents for the alkyl, cycloalkyl, aryl or allyl group as represented by R include an alkoxy group, an alkoxyalkoxy group, an alkoxyalkoxyalkoxy group, an allyloxy group, an aryloxy group, a cyano group, a hydroxyl group, a tetrahydrofuryl group, a halogen atom, etc.

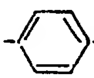
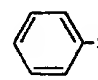
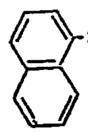
Substituents for the naphthalene ring as represented by ring A include a halogen atom, a cyano group, a thiocyanate group, an alkyl group having up to 10 carbon atoms, an alkoxy group having up to 10 carbon atoms, an alkylamino group, an acylamino group, an amino group, a hydroxy group, and a like nonionic substituent.

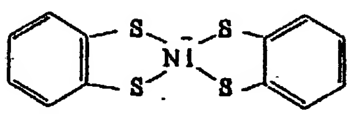
The substituted or unsubstituted aromatic amine residue as represented by K include residual groups of heterocyclic amines containing a nitrogen atom, an oxygen atom or a sulfur atom, residual groups of tetrahydroquinolines, and groups represented by formula:



wherein X and Y each represents a hydrogen atom, an alkyl group, an acylamino group, an alkoxy group, or a halogen atom; and R^2 and R^3 each represents a hydrogen atom, a substituted or unsubstituted alkyl group having up to 20 carbon atoms, a substituted or unsubstituted aryl group, a substituted or unsubstituted allyl group, or a substituted or unsubstituted cycloalkyl group.

Substituents for the alkyl, aryl, allyl or cycloalkyl group as represented by R^2 or R^3 include an alkoxy group, an alkoxyalkoxy group, an alkoxyalkoxyalkoxy group, an allyloxy group, an aryl group, an aryloxy group, a cyano group, a hydroxyl group, a tetrahydrofuryl group, etc.

Anions represented by Z^- include I^-, Br^-, Cl^-, ClO_4^-, BF_4^-, SCN^-, CH_3--SO_3^-, -SO_3^-, -SO_3^-, PF_6^-, SiF_6^-, TiF_6^-,



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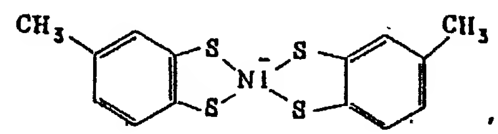

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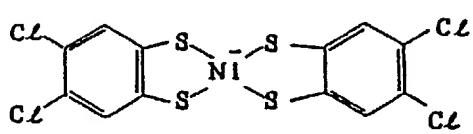

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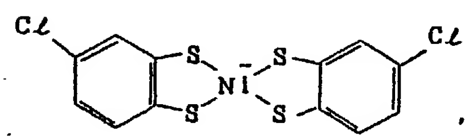

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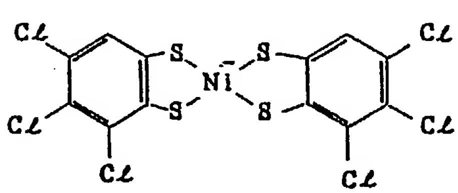

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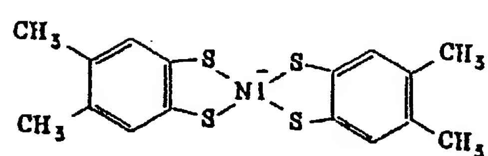

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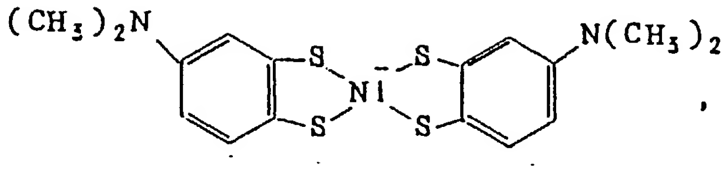

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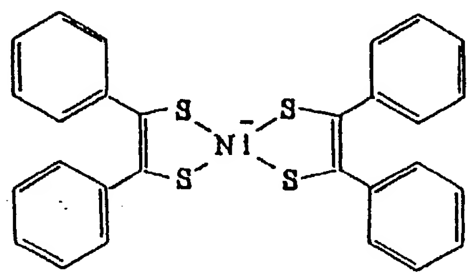

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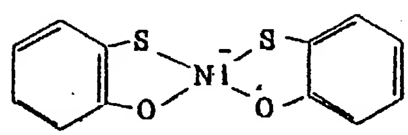

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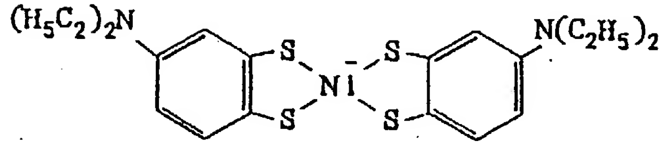

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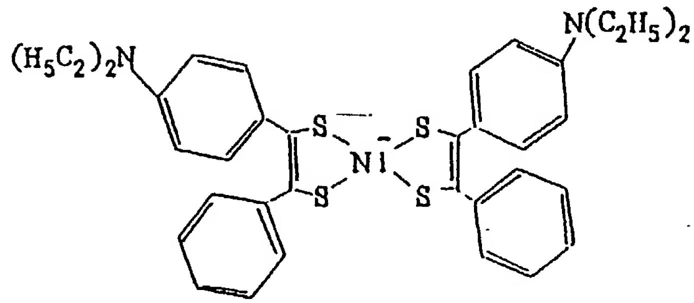

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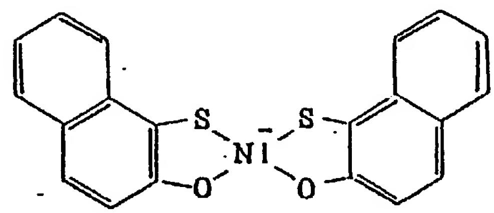
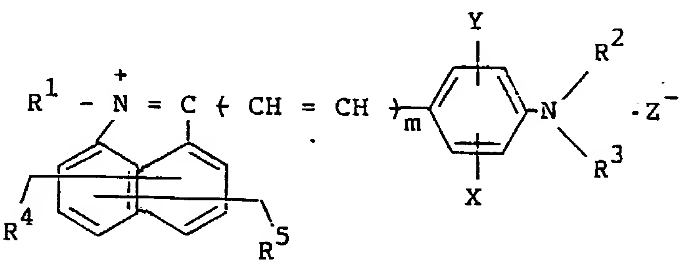


The naphtholactam dyes represented by formula (I) absorbs light in the wavelength region of from 600 to 900 nm and have a molecular absorption coefficient of from 10^4 to 10^5 cm^{-1}.

Among the naphtolactam dyes of formula (I), the preferred are those represented by formula (II):

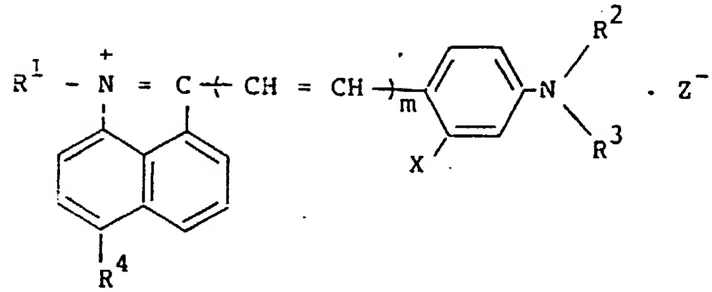


(II)

wherein X and Y each represents a hydrogen atom, a halogen atom, an alkyl group, an acylamino group, or an alkoxy group; R^1 represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted allyl group; R^2 and R^3 each represents a hydrogen atom, a substituted or unsubstituted alkyl group having up to 20 carbon atoms, a substituted or unsubstituted aryl group, a substituted or unsubstituted allyl group, or a substituted or unsubstituted cycloalkyl group; R^4 and R^5 each represents a hydrogen atom, a halogen atom, a cyano group, a thiocyanato group, an alkyl group having up to 10 carbon atoms, an alkoxy group having up to 10 carbon atoms, an alkylamino group, an acylamino group, an amino group, or a hydroxyl group; Z^- represents an anion; and m represents 1 or 2.

In formula (II), substituents for the alkyl, aryl, allyl, or cycloalkyl group as represented by R^2 or R^3 include an alkoxy group, an alkoxyalkoxy group, an allyloxy group, an aryl group, an aryloxy group, a cyano group, a hydroxyl group, a tetrahydrofurfuryl group, a halogen atom, etc. In the definition of the residues in formulae I and II the terms "alkyl" and "acyl", whether used alone or as part of other groups including alkoxy, alkylamino, acylamino etc., preferably refer to groups having up to 20, more preferably up to 10 carbon atoms unless otherwise stated. In a similar way the terms "cycloalkyl" and "aryl" preferably refer to groups having up to 10 carbon atoms. The term "halogen" refers to fluorine, chlorine, bromine and iodine atoms.

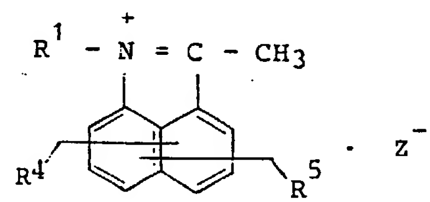
The more preferred of the naphtholactam dyes of formula (II) are those represented by formula (III):



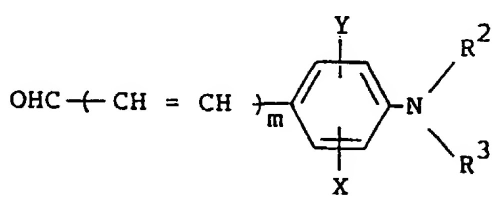
(III)

wherein X represents a hydrogen atom or a methyl group; R^1 represents an alkyl group having up to 8 carbon atoms, and preferably up to 5 carbon atoms, an alkyl group having up to 8 carbon atoms, and preferably up to 5 carbon atoms, which is substituted with an alkoxy group, preferably the one having up to 4 carbon atoms, an allyloxy group or a hydroxyl group, or an allyl group; R^2 and R^3 each represents an alkyl group having up to 8 carbon atoms, an alkyl group having up to 8 carbon atoms which is substituted with an alkoxy group, preferably the one having up to 4 carbon atoms, an alkoxyalkoxy group, preferably the one having up to 4 carbon atom, or an allyloxy group, a hydroxyl group or a halogen atom, or an allyl group; R^4 represents a hydrogen atom, a halogen atom, preferably a chlorine atom or a bromine atom, or a thiocyanate group; Z^- represents an anion; and m represents 1 or 2.

The naphtholactam dyes represented by formula (II) can easily be prepared by condensing a compound represented by formula:

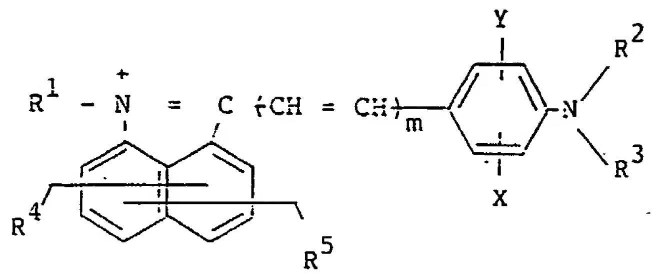


wherein R^1, R^4, R^5, and Z^- are as defined for formula (II), with an aromatic aldehyde represented by formula:



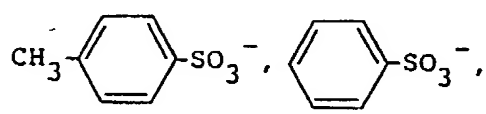
wherein X, Y, R^2,R^3, and m are as defined in formula (II).

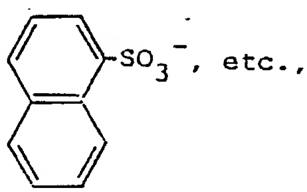
The naphtholactam dyes of formula (II) can also be prepared by reacting a compound represented by formula:



$\cdot\ Z^-$ (II)

wherein R^1, R^2, R^3, R^4, R^5, X, Y, and m are as defined above; and Z^- represents I^-, Br^-, Cl^-, ClO_4^-, BF_4^-, SCN^-, PF_6^-, SiF_6^-, TiF_6^-,

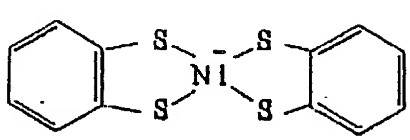




with a compound represented by formula:

$Q^- \bullet X^+$

wherein Q represents



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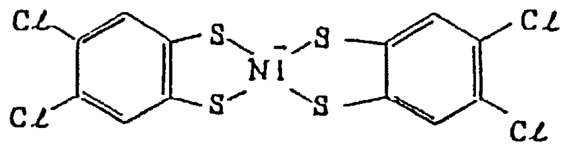

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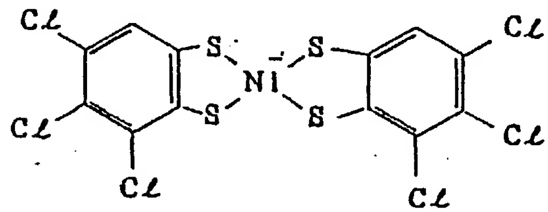

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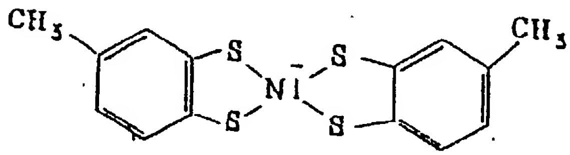

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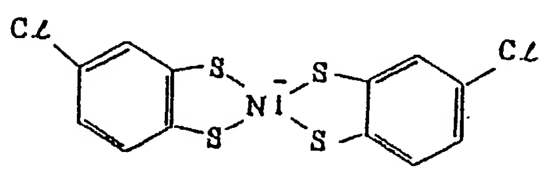

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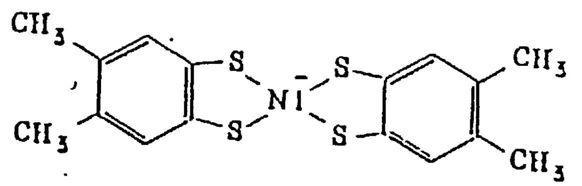

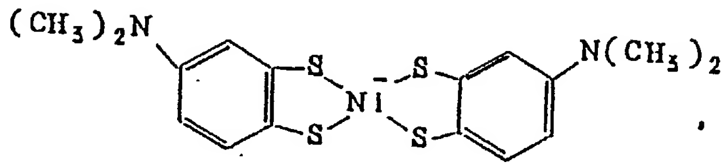

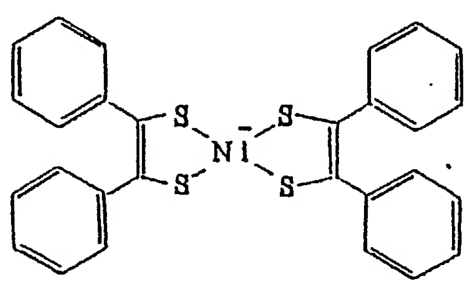

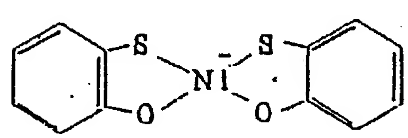

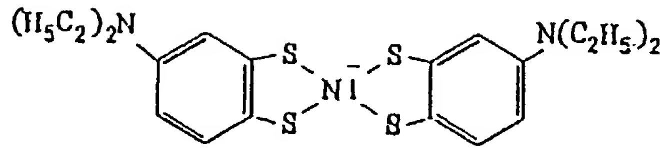

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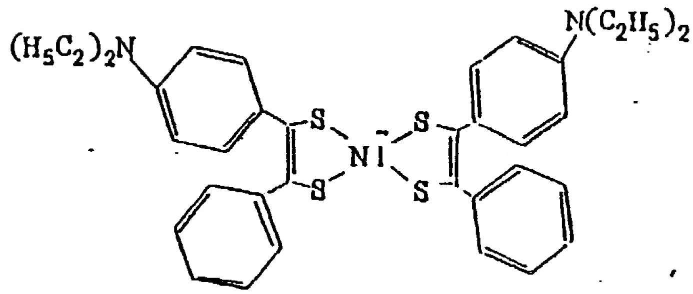

or

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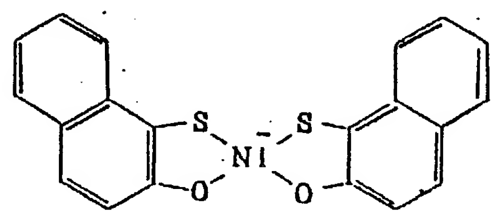


and X^+ represents a tetraalkylammonium cation, etc., in a polar solvent under heating with stirring.

The optical recording medium according to the present invention essentially comprises a support and a recording layer and, if desired, may further comprise a subbing layer on the support and a protective layer on the recording layer.

The support to be used may be either transparent or opaque to a laser beam used. Any of supports usually employed for this type of recording media, such as glass, plastics, paper, metal plates or foils, etc., may be used, with plastics being preferred from various respects. The plastics to be used include acrylic resins, methacrylic resins, vinyl acetate resins, vinyl chloride resins, nitrocellulose, polyethylene resins, polypropylene resins, polycarbonate resins, polyimide resins, polysulfone resins, and the like.

The recording layer of the optical recording medium of the invention has a thickness of from 100 Å to 5 µm, and preferably from 500 Å to 3 µm.

The recording layer can be formed by a commonly employed thin film formation techniques, such as a vacuum deposition process, a sputtering process, a doctor blade coating process, a casting process, a spinner coating process, a dip coating process, and the like.

In the formation of the recording layer, a binder may be simultaneously used in a naphtholactam type light absorbing dyes. Usable binders include polymers, such as polyvinyl alcohol, polyvinylpyrrolidone, nitrocellulose, celloluse acetate, polyvinyl butyral, polycarbonate, etc. The recording layer preferably contains at least 1% by weight of the naphtholactam dye based on the polymer binder.

In the case of coating the recording layer by the above-described doctor blade coating process, casting process, spinner coating process, dip coating process, and the like, and particularly spinner coating process, a solvent for coating is employed. Suitable solvents to be used include those having a boiling point of from 120° to 160°C, e.g., bromoform, dibromoethane, tetrachloroethane, ethyl cellosolve, xylene, chlorobenzene, cyclohexanone, etc. In the case of film formation by the spinner coating process, a rotational speed preferably ranges from 500 to 5,000 rpm, and the spin-coated layer may be heated or treated with a solvent vapor, if necessary.

For the purpose of ensuring stability or light resistance of the recording layer, the recording layer may contain, as a singlet state oxygen quencher, a transition metal chelate compound, e.g., acetylacetonato chelates, bisphenyldithiol, salicylaldehyde oxime chelates, bisdithiol-α-diketone, etc.

The recording layer according to the present invention may further contain other dyes in addition to the naphtholactam dyes of formula (I), such as naphtholactam dyes other than those of the present invention, indophenol dyes, triarylmethane dyes, azo dyes, cyanine dyes, squalilium dyes, etc.

The recording layer of the optical recording medium according to the present invention may be provided on either a single side or both sides of a support.

Recording on the optical recording medium of the invention can be performed by irradiating the recording layer provided on one or both sides of the support with a laser beam, and preferably a semiconductor laser beam, condensed to a diameter of about 1 μm. The laser irradiation induces thermal deformation of the recording layer due to energy absorption, such as decomposition, evaporation, melting, and the like, to thereby effect recording.

Reproduction of the thus recorded information can be carried out by irradiating a laser beam to read a difference in reflectance between the area where such a thermal deformation has taken place and the area where no thermal deformation has taken place.

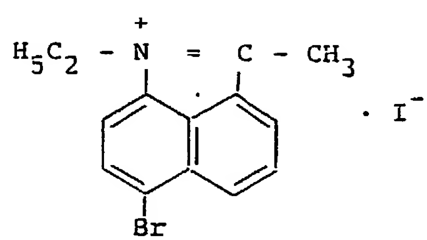
The laser beams which can be used for recording and reproduction include laser beams of N_2, He-Cd, Ar, He-Ne, ruby, semiconductors, dyes, and the like. Of these, semiconductor laser beams are preferred in view of their lightweight, small size, and ease on handling.

This invention will now be illustrated in greater detail with reference to the following examples, but it should be understood that they are not intended to limit the present invention.

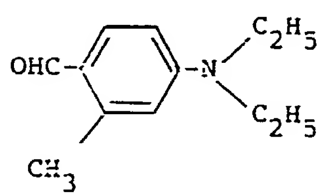
EXAMPLE 1

Synthesis of Naphtholactam Dye:

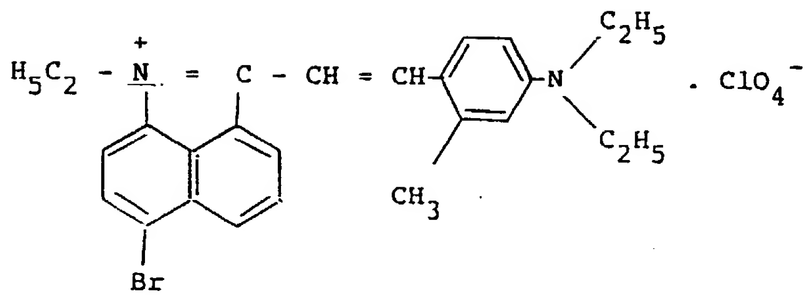
To a mixture of 250 g of glacial acetic acid and 50 g of acetic anhydride were added 39.0 g of a compound of formula:



and 19.1 g of a compound of formula:



and the mixture was heated at 100 to 105°C for 4 hours with stirring. After completion of the reaction, the reaction mixture was cooeld to room temperature, and poured into 1.5 liters of water containing 16.0 g of sodium perchlorate, followed by stirring at room temperature for 8 hours. The formed crystals were collected by filtration and dried to obtain 45 g of a naphtholactam dye having the following formula as a dark green crystals. A chloroform solution of this dye showed a λ_{max} of 740 nm.



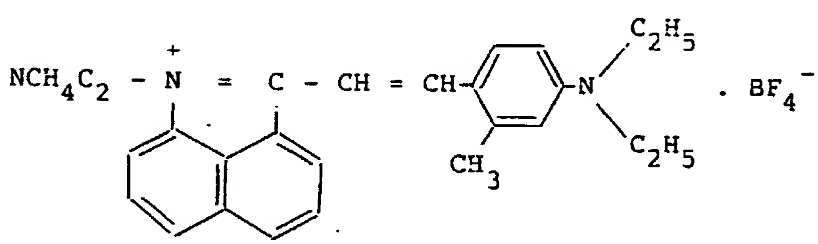
Production of Optical Recording Medium:

One gram of the naphtholactam dye as above prepared was dissolved in ethyl cellosolve, followed by filtration through a filter of 0.22 µm. 2 ml of thus obtained solution was dropped on a substrate of polycarbonate resin disc having a diameter of 130 mm which had been grooved to a depth of 700 Å and a width of 0.7 µm, and coated by a spinner at 800 rpm, followed by drying at 60°C for 20 minutes. For film thickness measurement, a glass plate was separately coated with the coating solution under the same conditions as above, and the film thickness was measured by means of Talystep (Rank Taylor Hobson KK) and was found to be 650 Å. The coated film exhibited its absorption maximum at a wavelength of 790 nm and a broad peak width.

When a semiconductor laser beam having a center wavelength of 830 nm and a beam diameter of 1 µm was irradiated on the coated film at an output of 6 mW, clear-outlined pits having a width of about 1 µm and a pit length of about 2 µm were formed. The carrier level/noise level ratio (C/N ratio) of the pits was 52 dB. The coating film exhibited satisfactory light resistance and resistance to reproducing light.

EXAMPLE 2

A naphtholactam dye of the formula shown below was synthesized in the same manner as described in Example 1. A chloroform solution of the dye had a λ_{max} of 740 nm.



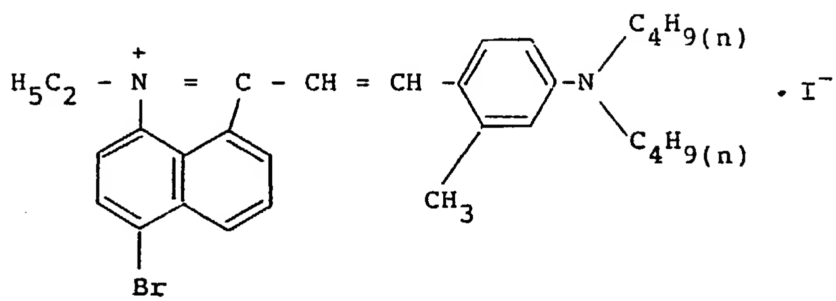
One gram of the naphtholactam dye thus obtained was dissolved in 50 g of dibromoethane, followed by filtration through a filter of 0.22 µm. 2 ml of the resulting solution was dropped on a substrate of methyl methacrylate resin (hereinafter referred to as PMMA) disc having a diameter of 120 mm which had been grooved to a depth of 700 Å and a width of 0.7 µm and coated by a spinner at 1200 rpm, followed by drying at 60°C for 10 minutes. The film thickness was measured in the same manner as in Example 1 and was found to be 700 Å. The coating film showed its absorption maximum at 790 nm with a broad peak width.

When a semiconductor laser beam having a center wavelength of 830 nm and a beam diameter of about 1 µm was irradiated on the coated film at an output of 6 mW, clear-outlined pits having a width of about 1 µm and a pit length of about 2 µm were formed. The C/N ratio of the pits was 48 dB. The coating film showed satisfactory light resistance and resistance to reproducing light.

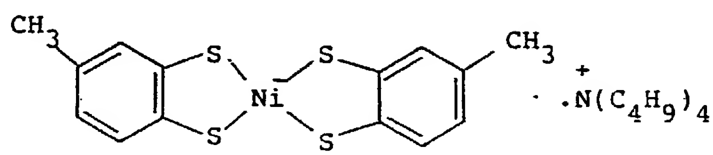
EXAMPLE 3

Synthesis of Naphtolactam Dye:

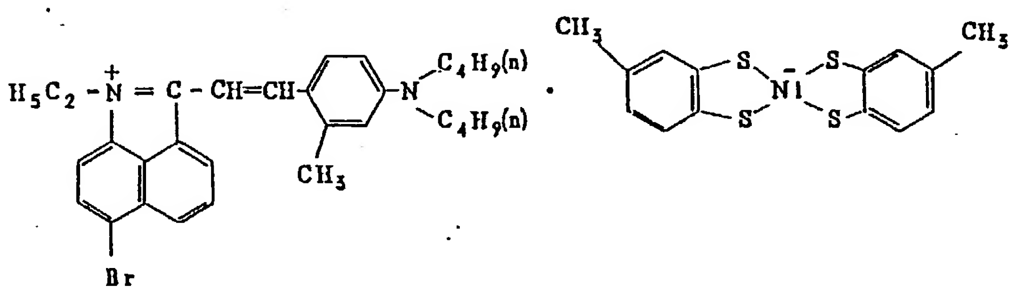
To 50 ml of N,N-dimethylformamide were added 6.48 g of a dye having formula:



and 6.20 g of a compound of formula



and the mixture was heated at 90 to 100°C for 3 hours. After cooling, the reaction mixture was poured into 300 ml of water, and the mixture was stirred at room temperature for 1 hour. The thus precipitated crystals were collected by filtration and dried to obtain 10.20 g of dark green crystals represented by the formula shown below. A chloroform solution of the product had a λ_{max} of 745 nm.



Production of Optical Recording Medium:

One gram of the naphtholactam dye as above prepared was dissolved in 50 g of tetrachloroethane, and the solution was filtered through a filter of 0.2 µm. 2 ml of the resulting solution was dropped on a substrate of PMMA disc having a diameter of 130 mm which had been grooved to a depth of 700 Å and a width of 0.7 µm and coated thereon by a spinner at 800 rpm, followed by drying at 60°C for 20 minutes. The film thickness was measured in the same manner as in Example 1 and was found to be 700 Å. The coated film exhibited its absorption maximum at 790 nm with a broad peak width.

When a semiconductor laser beam having a center wavelength of 830 nm and a beam diameter of 1 µm was irradiated on the coated film at an output of 6 mW, clear-outlined pits having a width of about 1 µm and a pit length of about 2 µm were formed. The C/N ratio of the pits was 52 dB. The coated film exhibited satisfactory light resistance and resistance to reproducing light.

EXAMPLES 4 TO 95

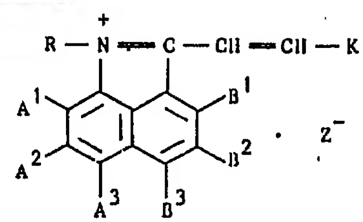
In the same manner as described in Example 1, naphtholactam dyes shown in Table 1 were synthesized. The wavelength of the absorption maximum of each of the resulting dye in its chloroform solution was as shown in Table 1.

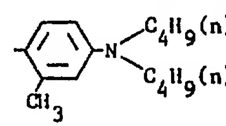
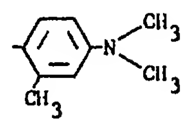
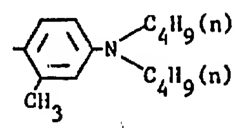
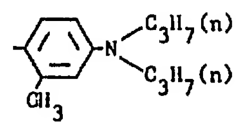
Each of the resulting dyes was coated on a substrate of grooved polycarbonate resin disc in the same manner as in Example 1. The wavelength of the absorption maximum of the coating film was as shown in Table 1.

When a semiconductor laser beam having a center wavelength of 830 nm was irradiated on the coated film, clearly outlined pits were formed. The thus formed recording layer had a high reflectance, high sensitivity, and an excellent C/N ratio, and exhibited satisfactory light resistance and resistance to reproducing light.

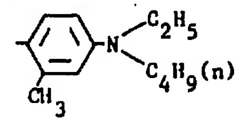
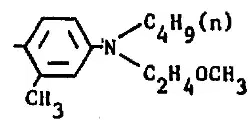
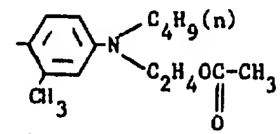
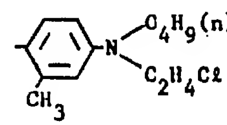
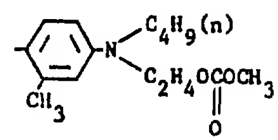
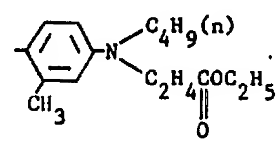
T A B L E 1

Naphtholactam Dye

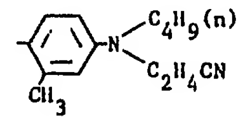
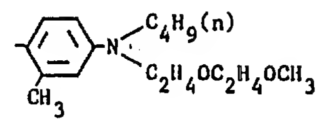
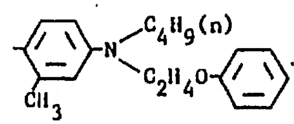
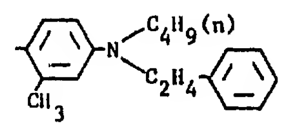
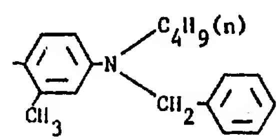
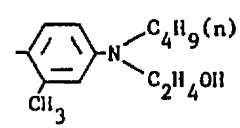


Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)	λ max (coating film) (nm)
4	$-C_2H_5$	-H	-H	-H	-H	-H	-H		I^-	740	790
5	"	"	"	-Br	"	"	"		ClO_4^-	735	780
6	"	"	"	"	"	"	"		"	745	790
7	"	"	"	"	"	"	"		"	745	785

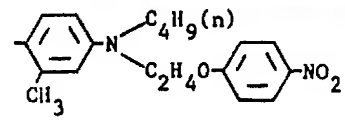
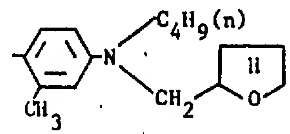
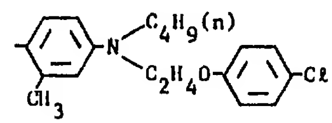
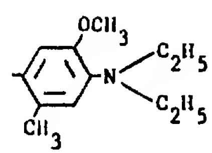
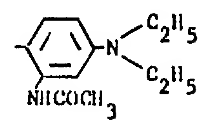
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)	λ max (coating film) (nm)
8	$-C_2H_5$	-H	-H	-Br	-H	-H	-H		ClO_4^-	745	790
9	"	"	"	"	"	"	"		"	740	780
10	"	"	"	"	"	"	"		"	735	775
11	"	"	"	"	"	"	"		"	730	770
12	"	"	"	"	"	"	"		"	735	780
13	"	"	"	"	"	"	"		"	735	780

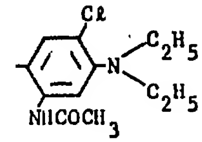
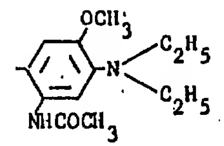
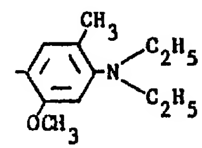
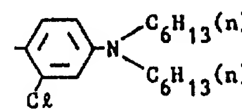
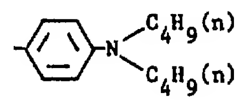
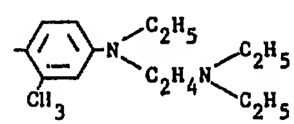
(cont'd)

Example No.	-R	-A¹	-A²	-A³	-B¹	-B²	-B³	-K	Z^-	λ max (in $CHCl_3$) (nm)	λ max (coating film) (nm)
14	$-C_2H_5$	-H	-H	-Br	-H	-H	-H		ClO_4^-	720	760
15	"	"	"	"	"	"	"		"	740	780
16	"	"	"	"	"	"	"		"	735	775
17	"	"	"	"	"	"	"		"	735	775
18	"	"	"	"	"	"	"		"	725	765
19	"	"	"	"	"	"	"		"	740	780

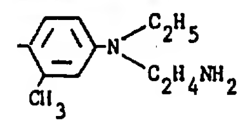
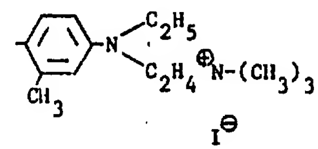
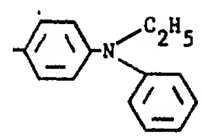
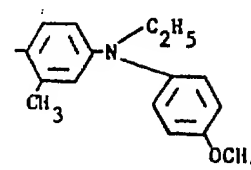
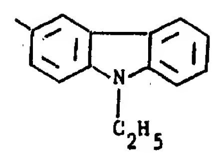
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)	λ max (coating film) (nm)
20	$-C_2H_5$	-H	-H	-Br	-H	-H	-H		ClO_4^-	735	775
21	"	"	"	"	"	"	"		"	740	780
22	"	"	"	"	"	"	"		"	735	775
23	"	"	"	"	"	"	"		"	765	800
24	"	"	"	"	"	"	"		"	780	820

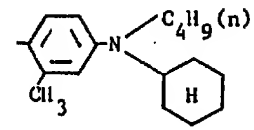
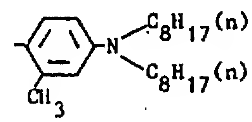
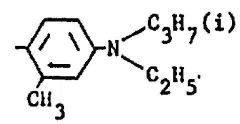
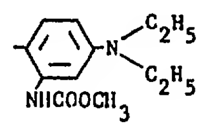
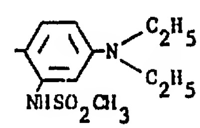
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)	λ max (coating film) (nm)
25	$-C_2H_5$	-H	-H	-Br	-H	-H	-H		ClO_4^-	760	800
26	"	"	"	"	"	"	"		I^-	800	845
27	"	"	"	"	"	"	"		"	770	815
28	"	"	"	"	"	"	"		"	715	755
29	"	"	"	"	"	"	"		"	725	760
30	"	"	"	"	"	"	"		"	735	770

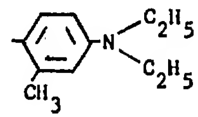
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)	λ max (coating film) (nm)
31	$-C_2H_5$	-H	-H	-Br	-H	-H	-H		I^-	735	755
32	"	"	"	"	"	"	"		"	735	775
33	"	"	"	"	"	"	"		Br^-	735	770
34	"	"	"	"	"	"	"		"	735	770
35	"	"	"	"	"	"	"		"	750	790

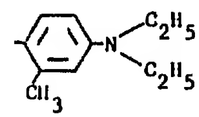
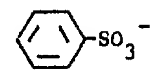
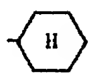
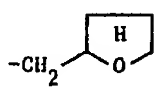
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)	λ max (coating film) (nm)
36	$-C_2H_5$	-H	-H	-Br	-H	-H	-H		Br^-	740	780
37	"	"	"	"	"	"	"		"	745	785
38	"	"	"	"	"	"	"		"	745	785
39	"	"	"	"	"	"	"		"	760	800
40	"	"	"	"	"	"	"		BF_4^-	755	795

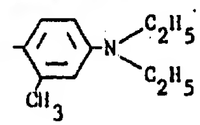
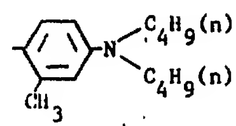
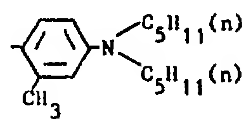
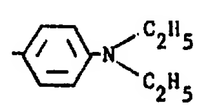
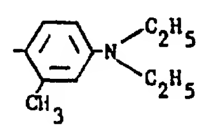
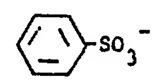
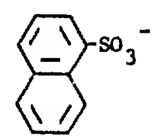
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)	λ max (coating film) (nm)
41	$-C_3H_7(n)$	-H	-H	-Br	-H	-H	-H		BF_4^-	740	780
42	$-C_5H_{11}(n)$	"	"	"	"	"	"	"	"	740	780
43	$-CH_2-$	"	"	"	"	"	"	"	"	745	780
44		"	"	"	"	"	"	"	"	745	785
45	$-C_2H_4OCH_3$	"	"	"	"	"	"	"	"	740	780
46	$-CH_2CH_2CH_2OCH_3$	"	"	"	"	"	"	"	"	740	775
47	$-C_3H_7-$	"	"	"	"	"	"	"	$-SO_3^-$	740	780
48	$-C_2H_4O-$	"	"	"	"	"	"	"	"	740	790
49	$-C_2H_4OC_2H_4OCH_3$	"	"	"	"	"	"	"	"	740	790
50	$-C_2H_4OC_2H_4OC_2H_4OCH_3$	"	"	"	"	"	"	"	"	740	790

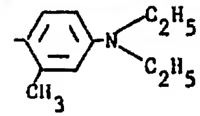
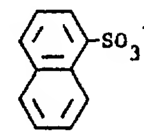
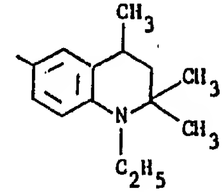
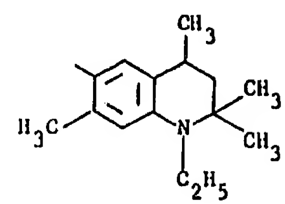
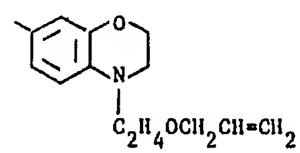
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)	λ max (coating film) (nm)
51	$-C_2H_4OCH_2CH{=}CH_2$	-H	-H	-Br	-H	-H	-H			740	785
52	$-CH_2CH{=}CH_2$	"	"	"	"	"	"	"	"	745	785
53		"	"	"	"	"	"	"	"	740	790
54	$-C_2H_4OCH_2CH{=}CH_2$	"	"	"	"	"	"	"	ClO_4^-	740	780
55	$-C_2H_4OH$	"	"	"	"	"	"	"	"	740	780
56	$-C_2H_4Cl$	"	"	"	"	"	"	"	SCN^-	745	785
57		"	"	"	"	"	"	"	"	740	770
58	$-C_2H_4CN$	"	"	"	"	"	"	"	"	745	775
59	"	"	"	-H	"	"	"	"	"	740	780

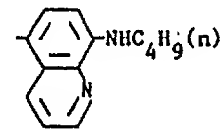
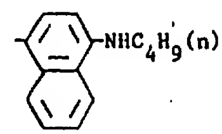
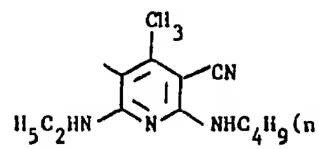
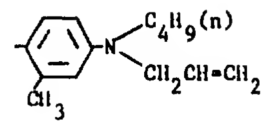
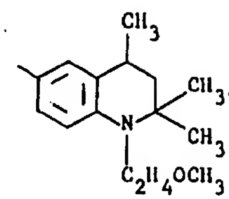
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)	λ max (coating Film) (nm)
60	$-C_2H_4CN$	-H	-H	$-N(CH_3)_2$	-H	-H	-H		SCN^-	780	820
61	"	"	"	-H	"	"	"		ClO_4^-	745	760
62	"	"	"	"	"	"	"		"	745	785
63	$-C_2H_5$	"	"	$-N(CH_3)_2$	"	"	"			740	780
64	"	"	"	-Cl	"	"	"			740	770
65	"	-Br	"	-Br	"	"	"	"		745	775

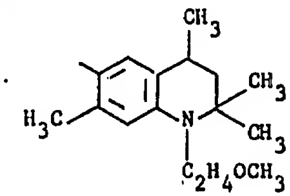
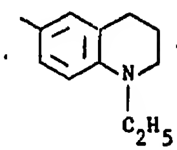
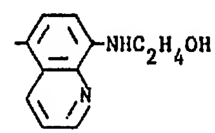
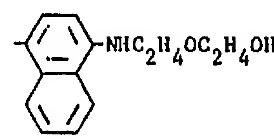
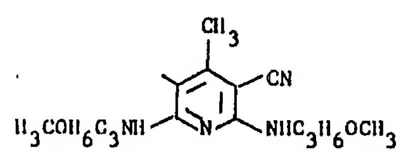
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)	λ max (coating Film) (nm)
66	$-C_2H_5$	-H	-H	$-OCH_3$	-H	-H	-H			750	790
67	"	"	"	$-NHCH_3$	"	"	"	"	"	760	795
68	"	"	"	-Br	"	"	"		ClO_4^-	760	790
69	"	"	"	"	"	"	"		"	780	810
70	"	"	"	"	"	"	"		"	760	800

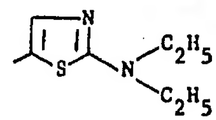
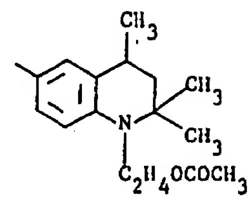
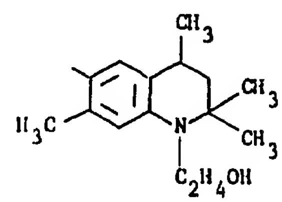
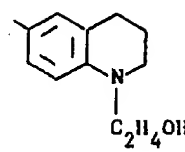
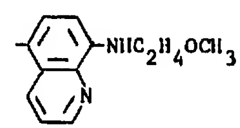
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)	λ max (coating film) (nm)
71	$-C_2H_5$	-H	-H	-Br	-H	-H	-H		ClO_4^-	785	815
72	"	"	"	"	"	"	"		"	785	810
73	"	"	"	"	"	"	"		"	770	800
74	"	"	"	"	"	"	"		"	740	790
75	"	"	"	"	"	"	"		"	755	790

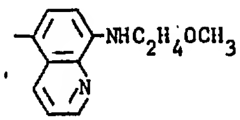
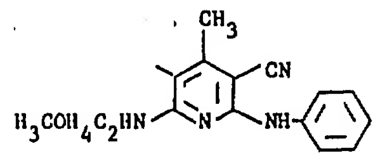
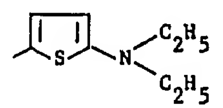
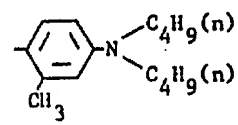
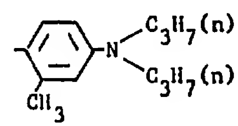
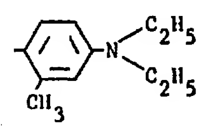
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)	λ max (coating film) (nm)
76	$-C_2H_5$	-H	-H	-Br	-H	-H	-H		ClO_4^-	775	805
77	"	"	"	-OH	"	"	"		"	755	795
78	"	"	"	$-NH_2$	"	"	"		"	775	810
79	"	"	"	$-NHC_2H_5$	"	"	"		"	775	805
80	"	"	"	$-NHCOCH_3$	"	"	"		"	755	800

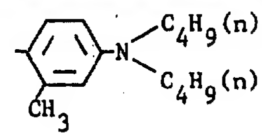
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)	λ max (coating film) (nm)
81	$-C_2H_5$	-H	-H	$-N(COCH_3)_2$	-H	-H	-H		ClO_4^-	740	770
82	"	"	"	-Br	"	"	"		"	750	780
83	"	-Br	"	"	"	"	"		"	780	820
84	"	"	"	"	-Br	"	"		"	750	770
85	"	"	"	"	"	"	-Br		"	775	800

(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)	λ max (coating film) (nm)
86	$-C_2H_5$	-Br	-H	$-CH_3$	-Br	-H	-Br		ClO_4^-	775	805
87	"	"	"	$-C_2H_5$	"	"	$-C_2H_5$		"	755	790
88	"	-H	"	-H	-H	"	-H		"	740	780
89	"	"	"	-SCN	"	"	"		SCN^-	748	780
90	"	"	"	"	"	"	"		"	745	770
91	"	"	"	"	"	"	"		"	740	765

(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)	λ max (coating film) (nm)
92	$-C_2H_5$	-H	-H	-Br	-H	-H	-H		SCN^-	747	780
93	"	"	"	"	"	"	"	"	PF_6^-	748	780
94	"	"	"	"	"	"	"	"	SiF_6^-	750	780
95	"	"	"	"	"	"	"	"	TiF_6^-	750	780

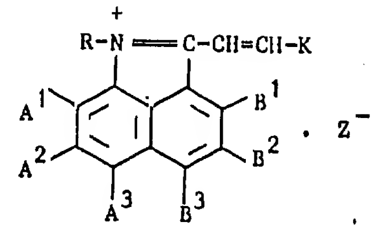
EXAMPLES 96 TO 184

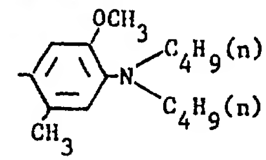
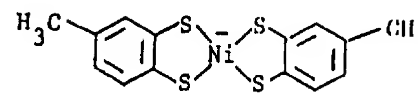
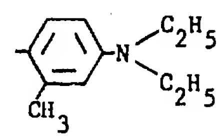
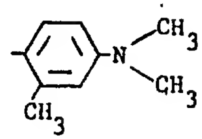
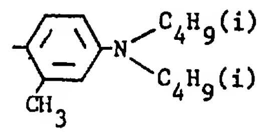
In the same manner as described in Example 3, naphtholactam dyes shown in Table 2 were synthesized. Each of the resulting naphtholactam dyes was coated on a substrate of grooved PMMA disc in the same manner as in Example 1 to form a coated film. The wavelength of the maximum absorption of the coated film was shown in Table 2.

When a laser beam having a center wavelength of 830 nm was irradiated on the coated film, clear-outlined pits were formed. The coated film had a high reflectance, high sensitivity, and an excellent C/N ratio and exhibited satisfactory light resistance and resistance to reproducing light.

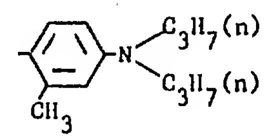
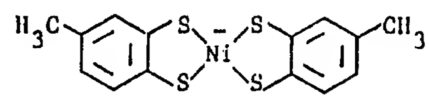
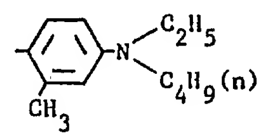
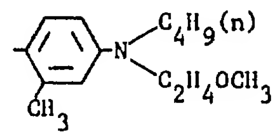
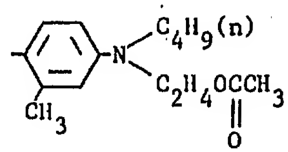
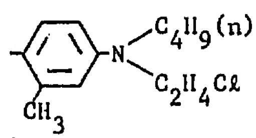
TABLE 2

Naphtholactam Dye

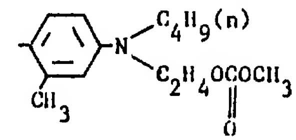
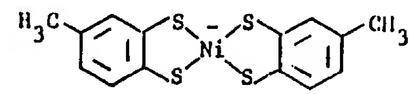
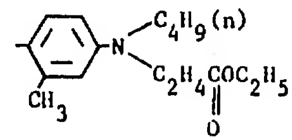
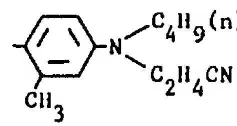
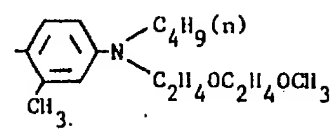
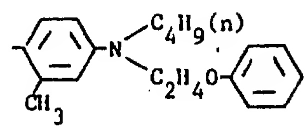
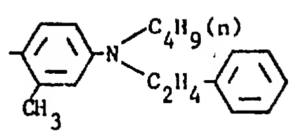


Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
96	$-C_2H_5$	-H	-H	-Br	-H	-H	-H			740
97	$-C_2H_4CN$	"	"	-H	"	"	"		"	740
98	$-C_2H_5$	"	"	-Br	"	"	"		"	780
99	"	"	"	"	"	"	"		"	790

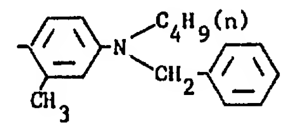
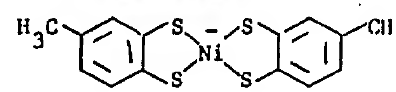
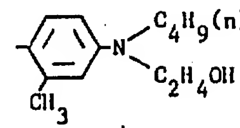
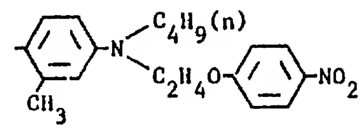
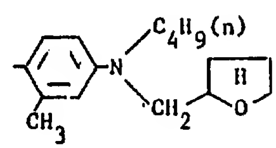
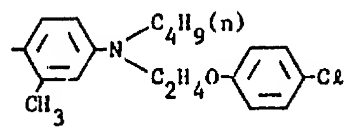
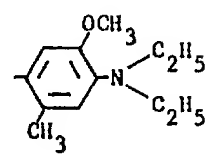
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
100	$-C_2H_5$	-H	-H	-Br	-H	-H	-H			785
101	"	"	"	"	"	"	"		"	790
102	"	"	"	"	"	"	"		"	780
103	"	"	"	"	"	"	"		"	775
104	"	"	"	"	"	"	"		"	770

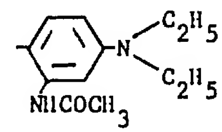
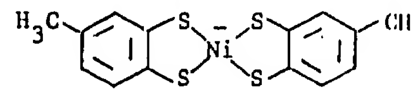
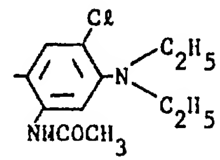
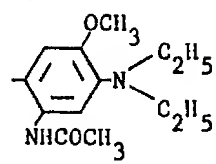
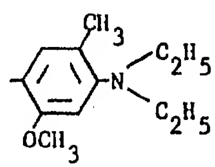
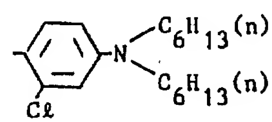
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
105	$-C_2H_5$	-H	-H	-Br	-H	-H	-H			780
106	"	"	"	"	"	"	"		"	780
107	"	"	"	"	"	"	"		"	760
108	"	"	"	"	"	"	"		"	780
109	"	"	"	"	"	"	"		"	775
110	"	"	"	"	"	"	"		"	775

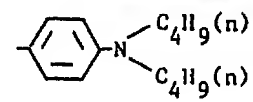
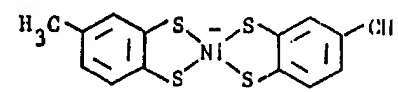
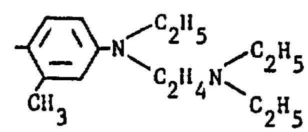
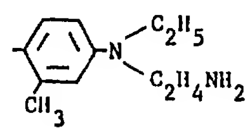
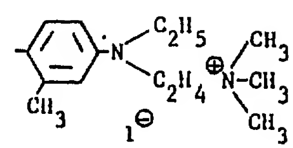
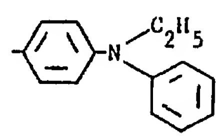
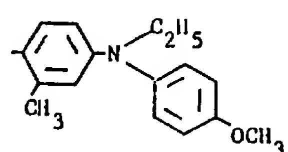
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
111	$-C_2H_5$	-H	-H	-Br	-H	-H	-H			765
112	"	"	"	"	"	"	"		"	780
113	"	"	"	"	"	"	"		"	775
114	"	"	"	"	"	"	"		"	780
115	"	"	"	"	"	"	"		"	775
116	"	"	"	"	"	"	"		"	800

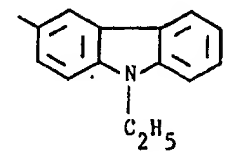
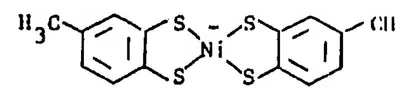
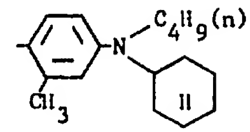
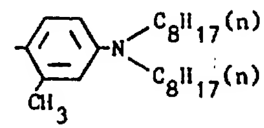
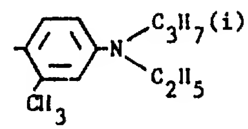
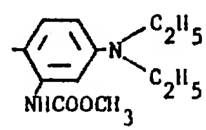
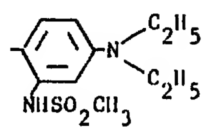
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
117	$-C_2H_5$	-H	-H	-Br	-H	-H	-H			820
118	"	"	"	"	"	"	"		"	800
119	"	"	"	"	"	"	"		"	845
120	"	"	"	"	"	"	"		"	815
121	"	"	"	"	"	"	"		"	755

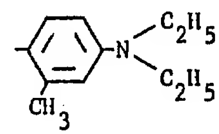
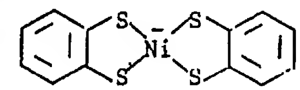
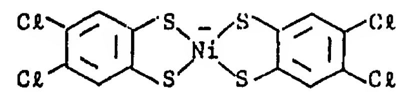
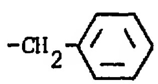
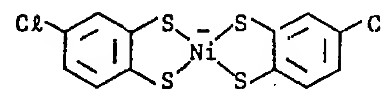
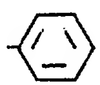
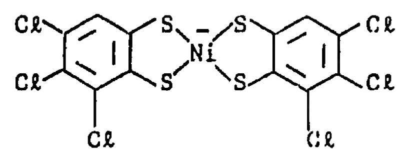
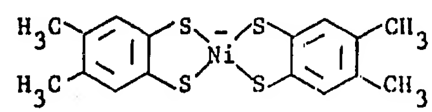
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
122	$-C_2H_5$	-H	-H	-Br	-H	-H	-H			760
123	"	"	"	"	"	"	"		"	770
124	"	"	"	"	"	"	"		"	755
125	"	"	"	"	"	"	"		"	775
126	"	"	"	"	"	"	"		"	770
127	"	"	"	"	"	"	"		"	770

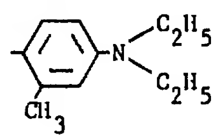
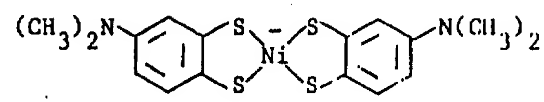
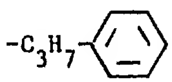
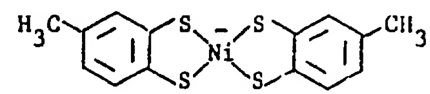
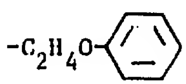
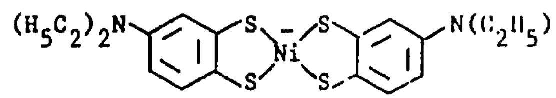
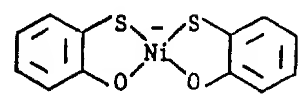
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
128	$-C_2H_5$	-H	-H	-Br	-H	-H	-H			790
129	"	"	"	"	"	"	"		"	780
130	"	"	"	"	"	"	"		"	785
131	"	"	"	"	"	"	"		"	785
132	"	"	"	"	"	"	"		"	800
133	"	"	"	"	"	"	"		"	795

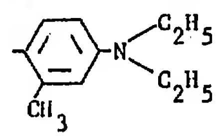
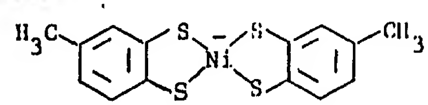
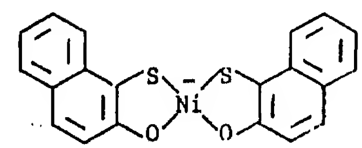
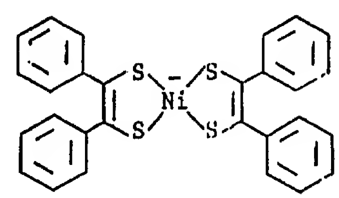
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating Film) (nm)
134	$-C_3H_7(n)$	-H	-H	-Br	-H	-H	-H			780
135	$-C_5H_{11}(n)$	"	"	"	"	"	"	"		780
136		"	"	"	"	"	"	"		780
137		"	"	"	"	"	"	"		785
138	$-C_2H_4OCH_3$	"	"	"	"	"	"	"		780

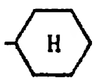
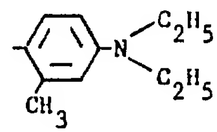
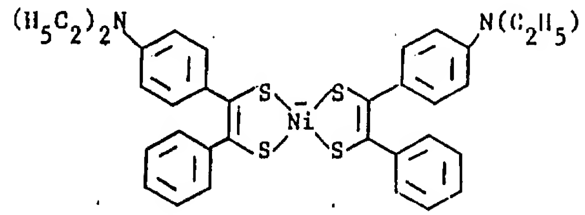
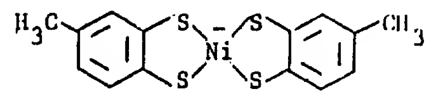
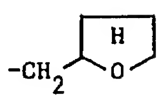
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
139	$-CH_2CH_2CH_2OCH_3$	-H	-H	-Br	-H	-H	-H			775
140		"	"	"	"	"	"	"		780
141		"	"	"	"	"	"	"		790
142	$-C_2H_4OC_2H_4OCH_3$	"	"	"	"	"	"	"		790

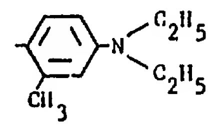
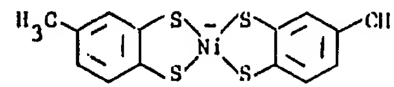
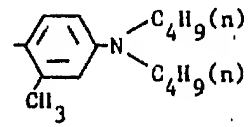
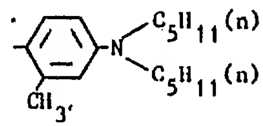
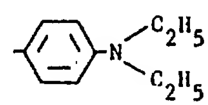
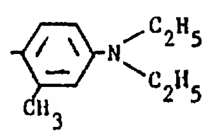
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
143	$-C_2H_4(OC_2H_4)_2OCH_3$	-H	-H	-Br	-H	-H	-H			790
144	$-C_2H_4OCH_2CH=CH_2$	"	"	"	"	"	"	"		785
145	$-CH_2CH=CH_2$	"	"	"	"	"	"	"		785

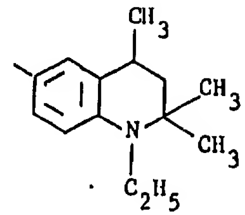
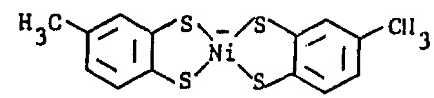
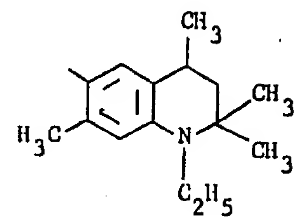
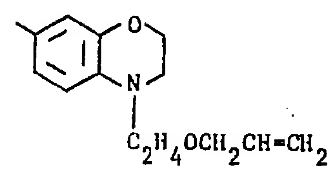
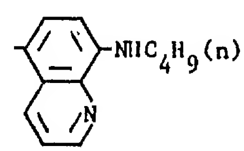
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
146		-H	-H	-Br	-H	-H	-H			790
147	$-C_2H_4OCH_2CH=CH_2$	"	"	"	"	"	"	"		780
148	$-C_2H_4OH$	"	"	"	"	"	"	"	"	780
149	$-C_2H_4Cl$	"	"	"	"	"	"	"	"	785
150		"	"	"	"	"	"	"	"	770
151	$-C_2H_4CN$	"	"	"	"	"	"	"	"	775
152	"	"	"	-H	"	"	"	"	"	780

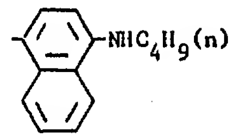
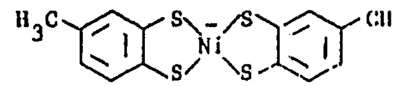
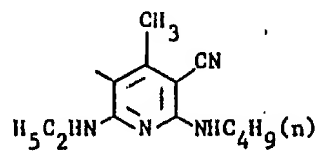
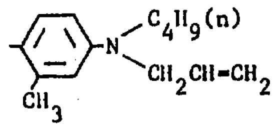
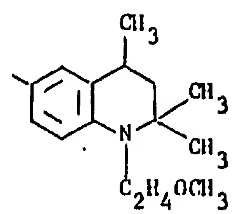
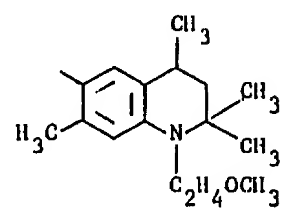
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
153	$-C_2H_4CN$	-H	-H	$-N(CH_3)_2$	-H	-H	-H			820
154	"	"	"	-H	"	"	"		"	760
155	"	"	"	"	"	"	"		"	785
156	$-C_2H_5$	"	"	$-N(CH_3)_2$	"	"	"		"	780
157	"	"	"	-Cl	"	"	"		"	770
158	"	-Br	"	-Br	"	"	"	"	"	775
159	"	-H	"	$-OCH_3$	"	"	"	"	"	790
160	"	"	"	$-NHCH_3$	"	"	"	"	"	795

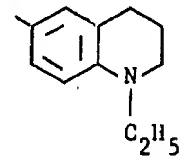
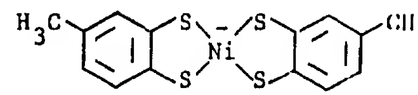
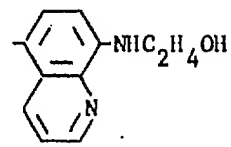
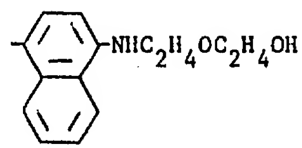
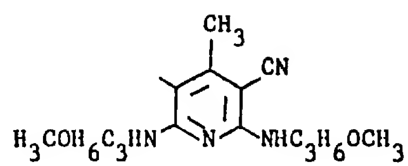
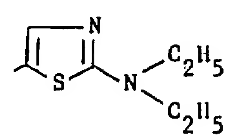
(cont'd)

Example No.	-R	-A1	-A2	-A3	-B1	-B2	-B3	-K	Z⁻	λ max (coating film) (nm)
161	$-C_2H_5$	-H	-H	-Br	-H	-H	-H			790
162	"	"	"	"	"	"	"		"	810
163	"	"	"	"	"	"	"		"	800
164	"	"	"	"	"	"	"		"	815

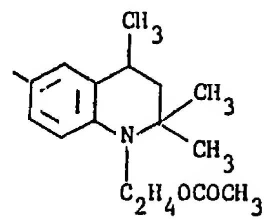
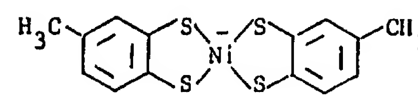
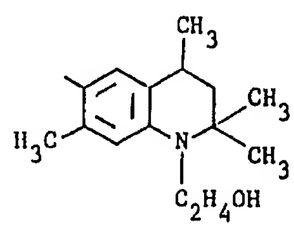
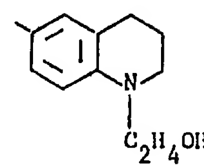
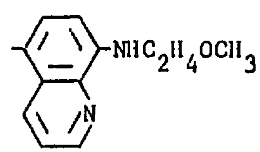
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
165	$-C_2H_5$	-H	-H	-Br	-H	-H	-H			810
166	"	"	"	"	"	"	"		"	800
167	"	"	"	"	"	"	"		"	790
168	"	"	"	"	"	"	"		"	790
169	"	"	"	"	"	"	"		"	805

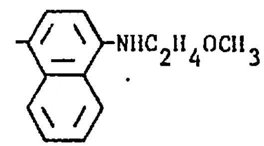
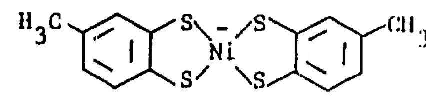
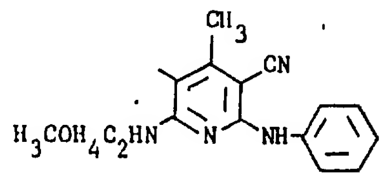
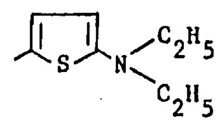
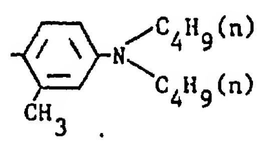
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
170	$-C_2H_5$	-H	-H	-OH	-H	-H	-H			795
171	"	"	"	$-NH_2$	"	"	"		"	810
172	"	"	"	$-NHC_2H_5$	"	"	"		"	805
173	"	"	"	$-NHCOCH_3$	"	"	"		"	800
174	"	"	"	$-N(COCH_3)_2$	"	"	"		"	770

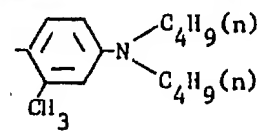
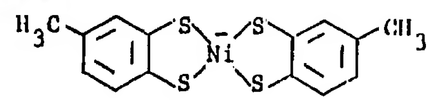
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
175	$-C_2H_5$	-H	-H	-Br	-H	-H	-H			780
176	"	-Br	"	"	"	"	"		"	820
177	"	"	"	"	-Br	"	"		"	770
178	"	"	"	"	"	"	-Br		"	800

(cont'd)

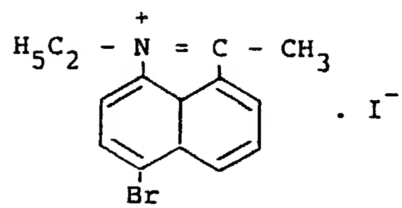
Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
179	$-C_2H_5$	-Br	-H	$-CH_3$	-Br	-H	-Br			805
180	"	"	"	$-C_2H_5$	"	"	$-C_2H_5$		"	790
181	"	-H	"	-H	-H	"	-H		"	780
182	"	-Br	"	-SCN	"	"	"		"	790

(cont'd)

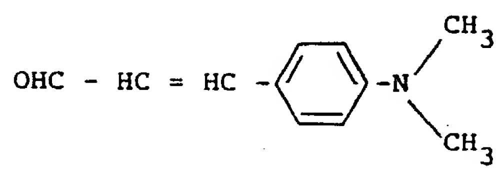
Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
183	$-C_3H_7(n)$	-Br	-H	-SCN	-H	-H	-H			790
184	$-C_4H_9(n)$	"	"	"	"	"	"	"	"	790

EXAMPLE 185

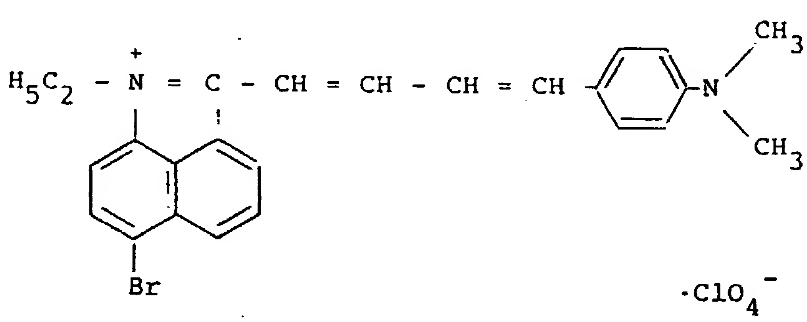
To a mixture of 250 g of glacial acetic acid and 50 g of acetic anhydride were added 40.2 g of a compound of formula:



and 17.5 g of a compound of formula:



and the mixture was heated at 100 to 105°C for 4 hours while stirring. After completion of the reaction, the reaction mixture was cooled to room temperature. The reaction mixture was then poured into 1.5 liters of water containing 16.0 g of sodium perchlorate, and the mixture was stirred at room temperature for 8 hours. The thus precipitated crystals were collected by filtration and dried to obtain 53.0 g of a naphthlactam dye of the formula shown below as dark green crystals. A chloroform solution of the dye had a λ_{max} of 800 nm.

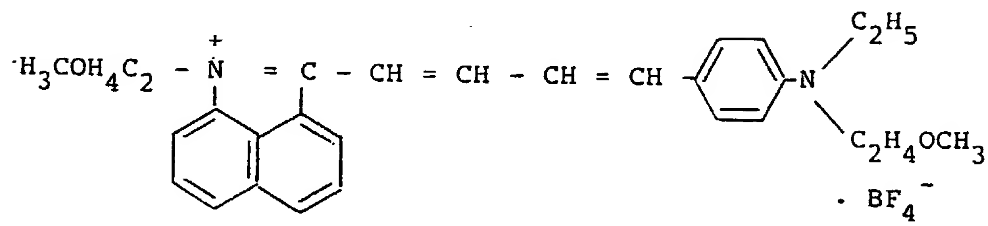


One gram of the naphtolactam dye as above obtained was dissolved in 50 g of dibromoethane, followed by filtration through a filter of 0.22 µm. The resulting solution (2 ml) was coated on a susbtrate of grooved PMMA disc in the same manner as in Example 2 to form a coating film having a thickness of 700 Å. The coated film had a λ_{max} of 820 nm with a broad peak width.

When a semiconductor laser beam having a center wavelength of 830 nm and a beam diameter of 1 µm was irradiated on the coated film at an output of 6 mW, clearly outlined pits having a width of about 1 µm and a pit length of about 2 µm were formed. The C/N ratio of the pits was 52 dB. The coated film exhibited satisfactory light resistance and resistance to reproducing light.

EXAMPLE 186

In the same manner as described in Example 185, a naphtholactam dye of the formula shown below was synthesized. A chloroform of the dye had a λ_{max} of 795 nm.

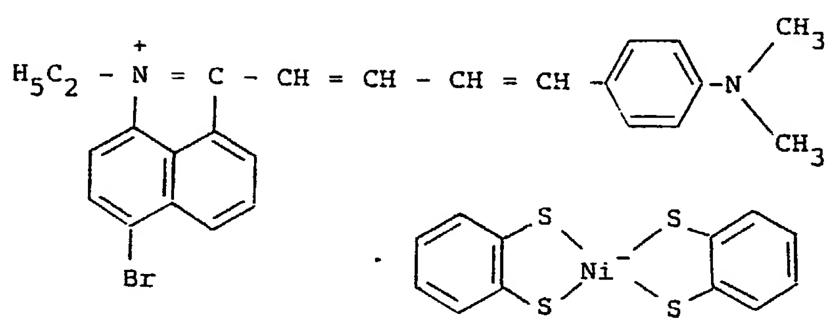


One gram of the naphtolactam dye as above prepared and 1.5 g of nitrocellulose ("RS-20" produced by Daicel Chemical Industries, Ltd.) were dissolved in 50 g of ethyl cellosolve, and the solution was filtered through a filter of 0.22 µm. 3 ml of the resulting solution was dropped on a substrate of polycarbonate resin disc having a diameter of 120 mm which had been grooved to a depth of 650 Å and a width of 0.7 µm and coated by a spinner at 1,500 rpm, followed by drying at 60°C for 10 minutes..The coated film has a thickness of 700 Å as measured in the same manner as in Example 1. The coated film exhibited maximum absorption at 810 nm of wavelength with a broad peak width.

When a semiconductor laser beam having a center wavelength of 830 nm and a beam diameter of 1 µm was irradiated on the coated film at an output of 6 mW, clearly outlined pits having a width of about 1 µm and a pit length of about 2 µm were formed. The thus formed recording layer had a C/N ratio of 51 dB and exhibited satisfactory light resistance and resistance to reproducing light.

EXAMPLE 187

A naphtholactam dye of the formula shown below was synthesized in the same manner as in Example 3. A chloroform solution of the dye had a λ_{max} of 800 nm.



One gram of the naphtholactam dye as above prepared was dissolved in 50 g of dibromoethane, followed by filtration through a filter of 0.22 µm. 2 ml of the resulting solution was dropped on a substrate of PMMA disc having a diameter of 120 mm which had been grooved to a depth of 700 Å and a width of 0.7 µm and coated by a spinner at 650 rpm, followed by drying at 60°C for 10 minutes. The film thickness was 800 Å as measured in the same manner as in Example 1. The coated film had a λ_{max} of 820 nm with a broad peak width.

When a semiconductor laser beam having a center wavelength of 830 nm and a beam diameter of 1 µm was irradiated on the coated film at an output of 6 mW, clearly outlined pits having a width of about 1 µm and a pit length of about 2 µm were formed. The recording layer thus formed had a C/N ratio of 51 dB and exhibited satisfactory light resistance and resistance to reproducing light.

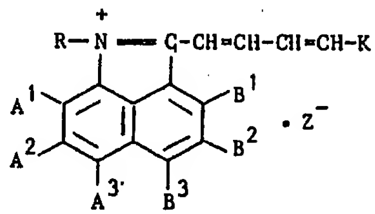
EXAMPLES 188 TO 278

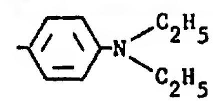
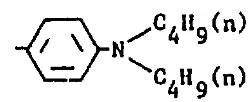
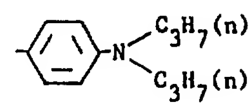
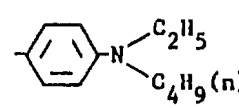
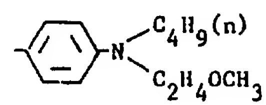
In the same manner as in Example 185, naphtholactam dyes shown in Table 3 were synthesized. The wavelength of the absorption maximum of each of the resulting dyes in its chloroform solution was as shown in Table 3.

Each of the dyes was coated on a substrate of grooved PMMA disc in the same manner as in Example 185 to form a recording layer. When a semiconductor laser beam having a center wavelength of 830 nm was irradiated on the recording layer, clearly outlined pits were formed. The recording layer had a high reflectance, high sensitivity, and an excellent C/N ratio and exhibited satisfactory light resistance and resistance to reproduced light.

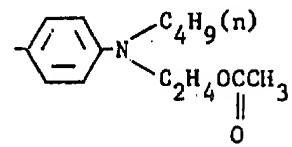
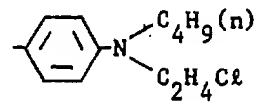
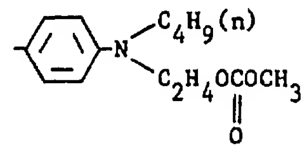
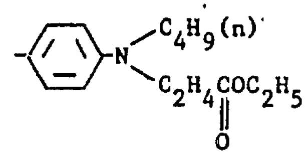
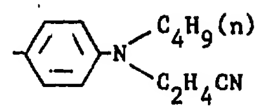
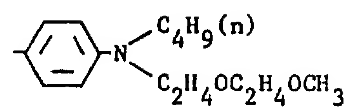
TABLE 3

Naphtholactam Dye

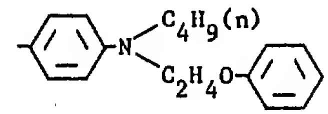
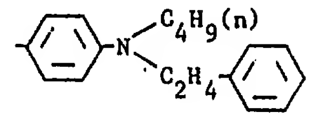
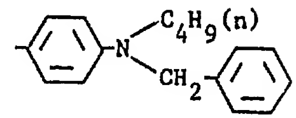
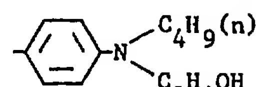
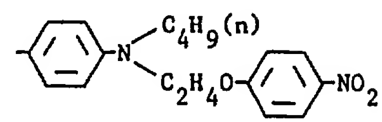
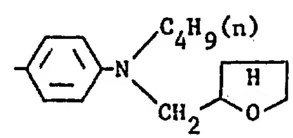
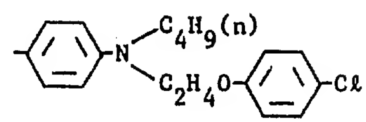


Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)
188	$-C_2H_5$	-H	-H	-Br	-H	-H	-H		$C\ell O_4^-$	805
189	"	"	"	"	"	"	"		"	810
190	"	"	"	"	"	"	"		"	807
191	"	"	"	"	"	"	"		"	807
192	"	"	"	"	"	"	"		"	800

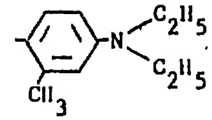
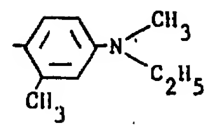
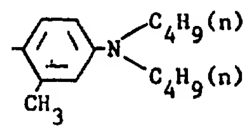
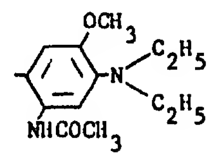
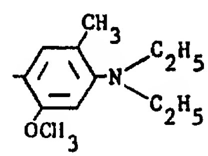
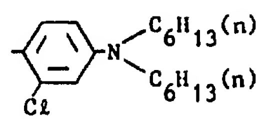
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max. (in $CHCl_3$) (nm)
193	$-C_2H_5$	-H	-H	-Br	-H	-H	-H		ClO_4^-	800
194	"	"	"	"	"	"	"		"	790
195	"	"	"	"	"	"	"		"	800
196	"	"	"	"	"	"	"		"	800
197	"	"	"	"	"	"	"		"	785
198	"	"	"	"	"	"	"		"	800

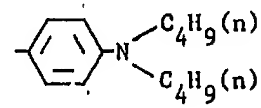
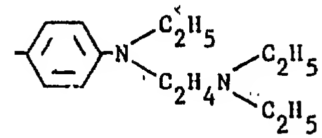
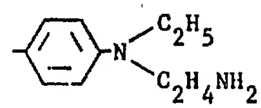
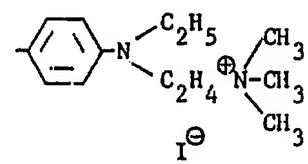
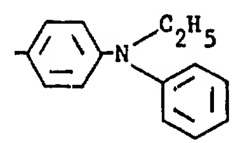
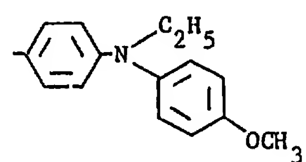
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)
199	$-C_2H_5$	-H	-H	-Br	-H	-H	-H		ClO_4^-	800
200	"	"	"	"	"	"	"		"	810
201	"	"	"	"	"	"	"		"	790
202	"	"	"	"	"	"	"		"	800
203	"	"	"	"	"	"	"		"	800
204	"	"	"	"	"	"	"		"	800
205	"	"	"	"	"	"	"		"	800

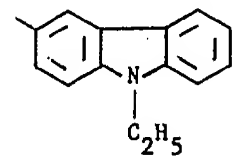
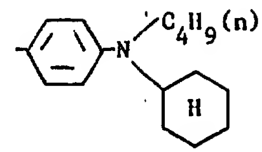
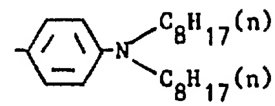
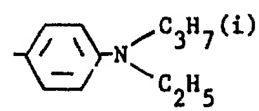
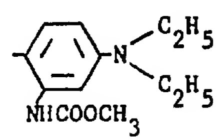
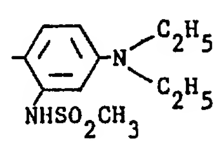
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)
206	$-C_2H_5$	-H	-H	-Br	-H	-H	-H		ClO_4^-	820
207	"	"	"	"	"	"	"		"	820
208	"	"	"	"	"	"	"		"	825
209	"	"	"	"	"	"	"		"	870
210	"	"	"	"	"	"	"		"	840
211	"	"	"	"	"	"	"		"	780

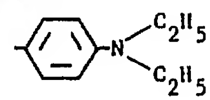
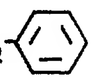
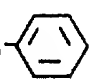
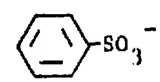
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)
212	$-C_2H_5$	-H	-H	-Br	-H	-H	-H		ClO_4^-	810
213	"	"	"	"	"	"	"		"	800
214	"	"	"	"	"	"	"		I^-	800
215	"	"	"	"	"	"	"		"	795
216	"	"	"	"	"	"	"		Br^-	810
217	"	"	"	"	"	"	"		"	810

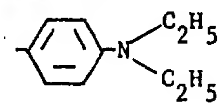
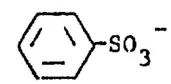
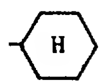
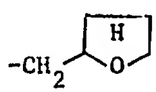
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max. (in $CHCl_3$) (nm)
218	$-C_2H_5$	-H	-H	-Br	-H	-H	-H		Br^-	830
219	"	"	"	"	"	"	"		"	820
220	"	"	"	"	"	"	"		"	815
221	"	"	"	"	"	"	"		"	806
222	"	"	"	"	"	"	"		"	840
223	"	"	"	"	"	"	"		BF_4^-	835

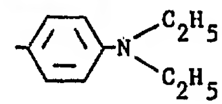
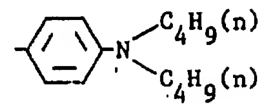
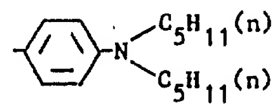
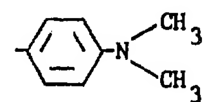
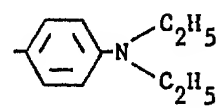
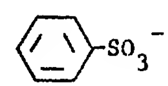
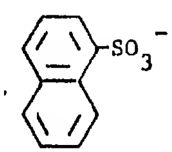
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)
224	$-C_3H_7(n)$	-H	-H	-Br	-H	-H	-H		BF_4^-	805
225	$-C_5H_{11}(n)$	"	"	"	"	"	"	"	"	805
226	$-CH_2-$	"	"	"	"	"	"	"	"	805
227		"	"	"	"	"	"	"	"	805
228	$-C_2H_4OCH_3$	"	"	"	"	"	"	"	"	805
229	$-CH_2CH_2CH_2OCH_3$	"	"	"	"	"	"	"	"	805
230	$-C_3H_7-$	"	"	"	"	"	"	"		805
231	$-C_2H_4O-$	"	"	"	"	"	"	"	"	805
232	$-C_2H_4OC_2H_4OCH_3$	"	"	"	"	"	"	"	"	805
233	$-C_2H_4OC_2H_4OC_2H_4OCH_3$	"	"	"	"	"	"	"	"	805

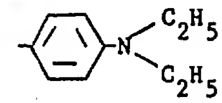
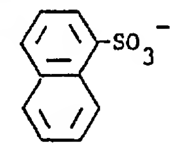
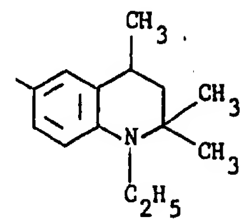
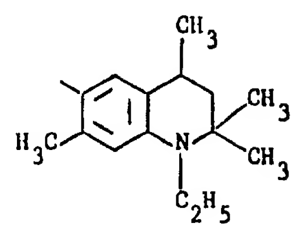
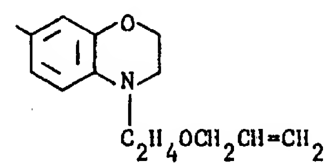
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ . max (in $CHCl_3$) (nm)
234	$-C_2H_4OCH_2CH=CH_2$	-H	-H	-Br	-H	-H	-H			805
235	$-CH_2CH=CH_2$	"	"	"	"	"	"	"	"	805
236		"	"	"	"	"	"	"	"	805
237	$-C_2H_4OCH_2CH=CH_2$	"	"	"	"	"	"	"	ClO_4^-	805
238	$-C_2H_4OH$	"	"	"	"	"	"	"	"	805
239	$-C_2H_4Cl$	"	"	"	"	"	"	"	SCN^-	810
240		"	"	"	"	"	"	"	"	805
241	$-C_2H_4CN$	"	"	"	"	"	"	"	"	810
242	"	"	"	-H	"	"	"	"	"	800

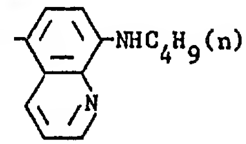
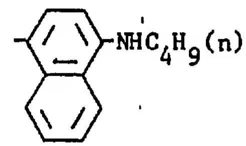
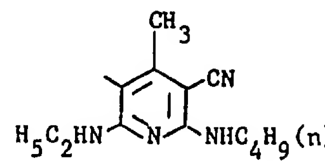
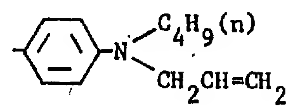
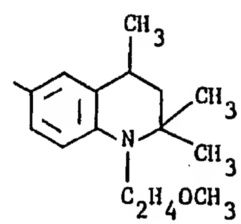
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)
243	$-C_2H_4CN$	-H	-H	$-N(CH_3)_2$	-H	-H	-H		SCN^-	820
244	"	"	"	-H	"	"	"		$C\ell O_4^-$	810
245	"	"	"	"	"	"	"		"	810
246	-H	"	"	"	"	"	"			800
247	$-C_2H_5$	"	"	$-N(CH_3)_2$	"	"	"		"	820
248	"	"	"	$-C\ell$	"	"	"	"		805
249	"	-Br	"	-Br	"	"	"	"		810

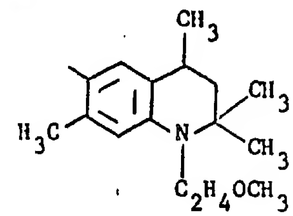
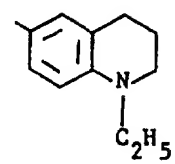
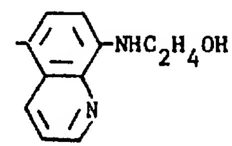
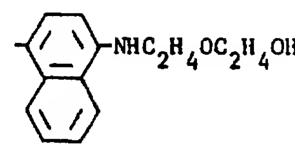
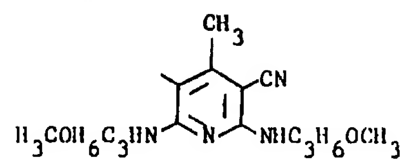
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ_{max} (in $CHCl_3$) (nm)
250	$-C_2H_5$	-H	-H	$-OCH_3$	-H	-H	-H			815
251	"	"	"	$-NHCH_3$	"	"	"	"	"	820
252	"	"	"	-Br	"	"	"		ClO_4^-	840
253	"	"	"	"	"	"	"		"	860
254	"	"	"	"	"	"	"		"	840

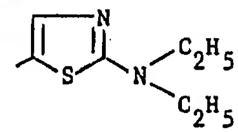
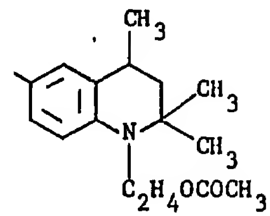
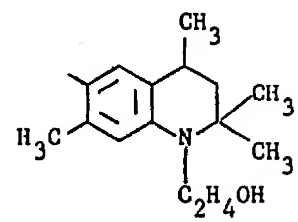
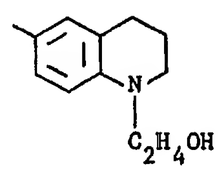
(cont'd)

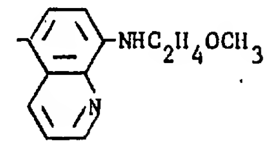
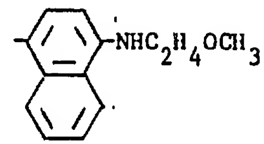
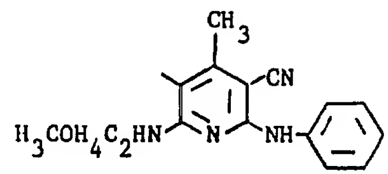
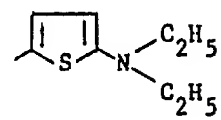
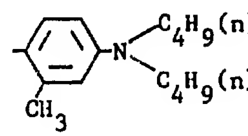
Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)
255	$-C_2H_5$	-H	-H	-Br	-H	-H	-H		ClO_4^-	860
256	"	"	"	"	"	"	"		"	860
257	"	"	"	"	"	"	"		"	850
258	"	"	"	"	"	"	"		"	800
259	"	"	"	"	"	"	"		"	835

(cont'd)

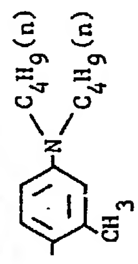
Example No.	-R	-A^1	-A^2	-A^3	-B^1	-B^2	-B^3	-K	Z^-	λ max (in $CHCl_3$) (nm)
260	$-C_2H_5$	-H	-H	-Br	-H	-H	-H		ClO_4^-	855
261	"	"	"	-OH	"	"	"		"	835
262	"	"	"	$-NH_2$	"	"	"		"	860
263	"	"	"	$-NHC_2H_5$	"	"	"		"	865
264	"	"	"	$-NHCOCH_3$	"	"	"		"	835

(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)
265	$-C_2H_5$	-H	-H	$-N(COCH_3)_2$	-H	-H	-H		ClO_4^-	820
266	"	"	"	-Br	"	"	"		"	830
267	"	-Br	"	"	"	"	"		"	860
268	"	"	"	"	-Br	"	"		"	830

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)
269	$-C_2H_5$	-Br	-H	-Br	-Br	-H	-Br		ClO_4^-	855
270	"	"	"	$-CH_3$	"	"	"		"	855
271	"	"	"	$-C_2H_5$	"	"	$-C_2H_5$		"	835
272	"	-H	"	-H	-H	"	-H		"	820
273	"	"	"	-SCN	"	"	"		SCN^-	828

(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (in $CHCl_3$) (nm)
274	$-C_3H_7(n)$	-H	-H	-SCN	-H	-H	-H		SCN^-	828
275	"	"	"	-Br	"	"	"	"	"	825
276	$-C_2H_5$	"	"	"	"	"	"	"	PF_6^-	825
277	"	"	"	"	"	"	"	"	SiF_6^-	825
278	"	"	"	"	"	"	"	"	TiF_6^-	820

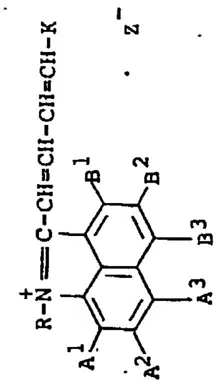
EXAMPLES 279 TO 365

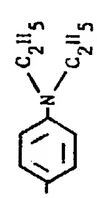
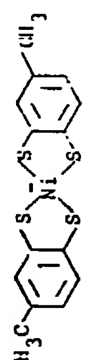
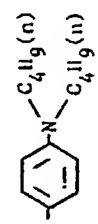
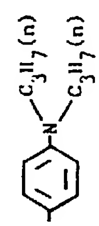
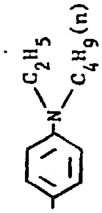
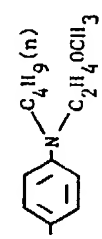
In the same manner as described in Example 187, naphtholactam dyes shown in Table 4 were synthesized. Each of the resulting naphtholactam dyes was coated on a substrate of grooved PMMA disc in the same manner as in Example 187 to form a coated film. The wavelength of the maximum absorption of the coated film was shown in Table 4.

When a laser beam having a center wavelength of 830 nm was irradiated on the coated film, clear-outlined pits were formed. The coated film had a high reflectance, high sensitivity, and an excellent C/N ratio and exhibited satisfactory light resistance and resistance to reproducing light.

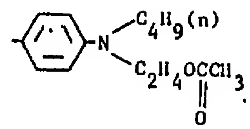
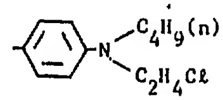
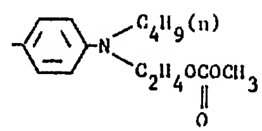
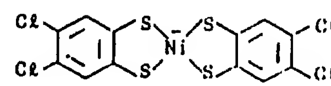
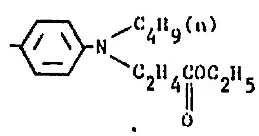
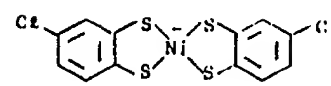
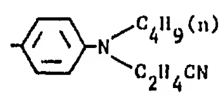
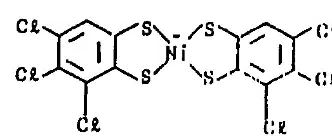
Table 4

Naphtholactam Dye

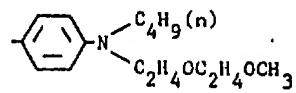
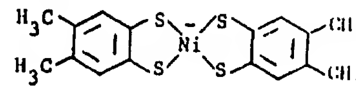
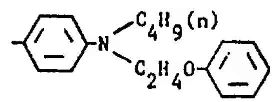
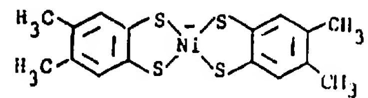
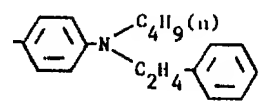
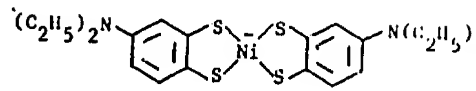
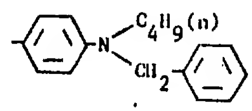
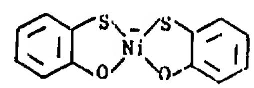
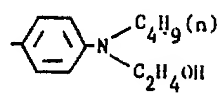
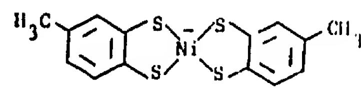


Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
279	$-C_2H_5$	-H	-H	-Br	-H	-H	-H			825
280	"	"	"	"	"	"	"		"	830
281	"	"	"	"	"	"	"		"	827
282	"	"	"	"	"	"	"		"	827
283	"	"	"	"	"	"	"		"	815

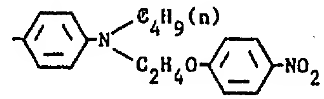
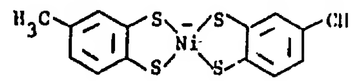
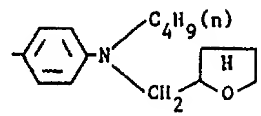
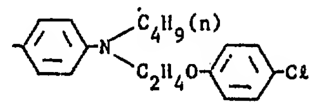
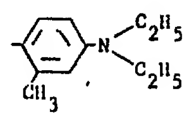
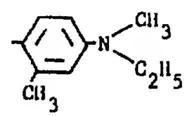
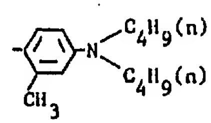
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
284	"	"	"	"	"	"	"		"	815
285	"	"	"	"	"	"	"		"	810
286	$-C_2H_5$	-H	-H	-Br	-H	-H	-H			815
287	"	"	"	"	"	"	"			815
288	"	"	"	"	"	"	"			800

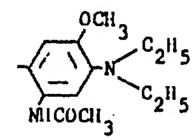
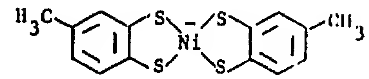
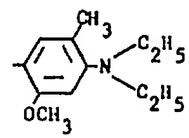
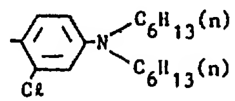
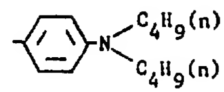
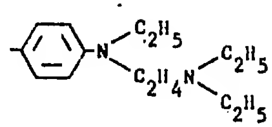
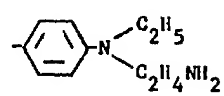
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
289	"	"	"	"	"	"	"			815
290	"	"	"	"	"	"	"			815
291	$-C_2H_5$	-H	-H	-Br	-H	-H	-H			825
292	"	"	"	"	"	"	"			805
293	"	"	"	"	"	"	"			815

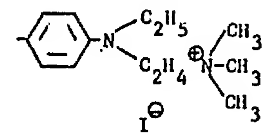
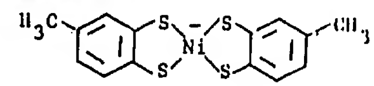
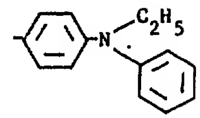
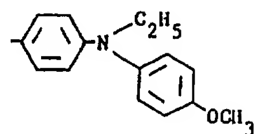
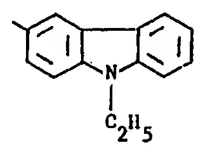
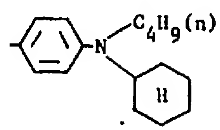
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
294	$-C_2H_5$	-H	-H	-Br	-H	-H	-H			815
295	"	"	"	"	"	"	"		"	815
296	"	"	"	"	"	"	"		"	820
297	"	"	"	"	"	"	"		"	835
298	"	"	"	"	"	"	"		"	835
299	"	"	"	"	"	"	"		"	840

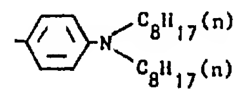
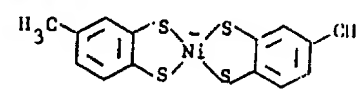
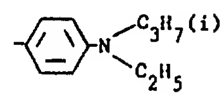
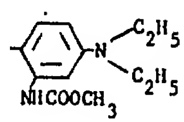
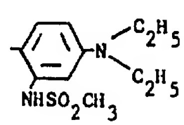
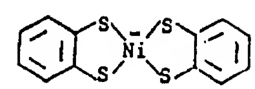
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
300	$-C_2H_5$	-H	-H	-Br	-H	-H	-H			870
301	"	"	"	"	"	"	"		"	850
302	"	"	"	"	"	"	"		"	800
303	"	"	"	"	"	"	"		"	830
304	"	"	"	"	"	"	"		"	820
305	"	"	"	"	"	"	"		"	820

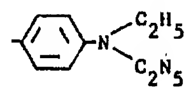
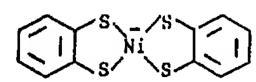
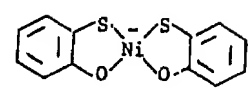
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
306	$-C_2H_5$	-H	-H	-Br	-H	-H	-H			815
307	"	"	"	"	"	"	"		"	830
308	"	"	"	"	"	"	"		"	830
309	"	"	"	"	"	"	"		"	845
310	"	"	"	"	"	"	"		"	815

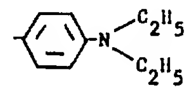
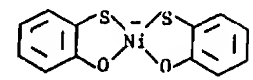
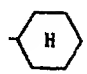
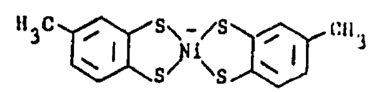
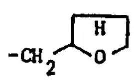
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
311	$-C_2H_5$	-H	-H	-Br	-H	-H	-H			835
312	"	"	"	"	"	"	"		"	826
313	"	"	"	"	"	"	"		"	855
314	"	"	"	"	"	"	"			845

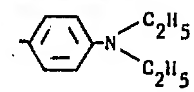
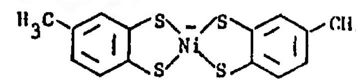
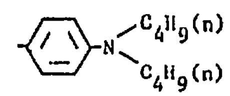
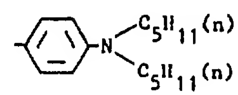
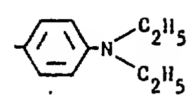
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (exciting film) (nm)
315	$-C_3H_7(n)$	-H	-H	-Br	-H	-H	-H			825
316	$-C_5H_{11}(n)$	"	"	"	"	"	"	"	"	825
317	$-CH_2-$	"	"	"	"	"	"	"	"	825
318		"	"	"	"	"	"	"	"	825
319	$-C_2H_4OCH_3$	"	"	"	"	"	"	"	"	825
320	$-CH_2CH_2CH_2OCH_3$	"	"	"	"	"	"	"	"	825
321	$-C_3H_7-$	"	"	"	"	"	"	"		820
322	$-C_2H_4O-$	"	"	"	"	"	"	"	"	820
323	$-C_2H_4OC_2H_4OCH_3$	"	"	"	"	"	"	"	"	820

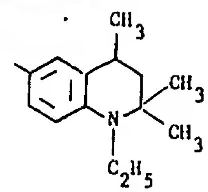
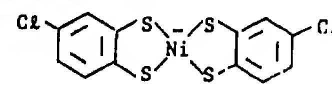
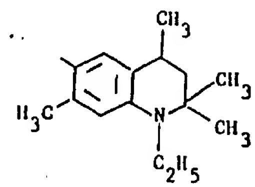
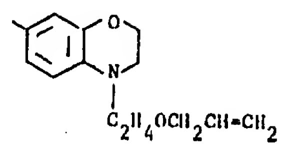
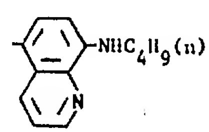
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (exciting film) (nm)
324	$-C_2H_4OC_2H_4OC_2H_4OCH_3$	-H	-H	-Br	-H	-H	-H			825
325	$-C_2H_4OCH_2CH{=}CH_2$	"	"	"	"	"	"	"	"	825
326	$-CH_2CH{=}CH_2$	"	"	"	"	"	"	"	"	820
327		"	"	"	"	"	"	"	"	825
328	$-C_2H_4OCH_2CH{=}CH_2$	"	"	"	"	"	"	"		825
329	$-C_2H_4OH$	"	"	"	"	"	"	"	"	825
330	$-C_2H_4Cl$	"	"	"	"	"	"	"	"	830
331		"	"	"	"	"	"	"	"	825
332	$-C_2H_4CN$	"	"	"	"	"	"	"	"	830
333	"	"	"	-H	"	"	"	"	"	820

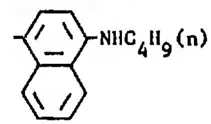
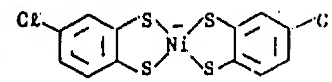
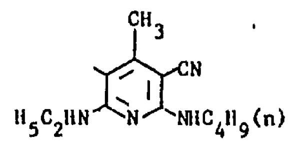
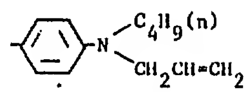
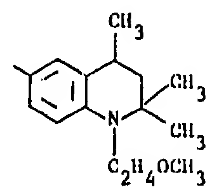
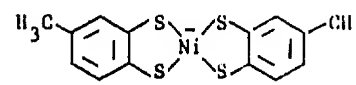
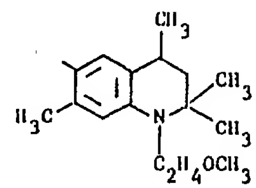
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
334	$-C_2H_4CN$	-H	-H	$-N(CH_3)_2$	-H	-H	-H			835
335	"	"	"	-H	"	"	"		"	830
336	"	"	"	"	"	"	"		"	830
337	$-C_2H_5$	"	"	$-N(CH_3)_2$	"	"	"		"	835
338	"	"	"	-Cℓ	"	"	"	"	"	815
339	"	-Br	"	-Br	"	"	"	"	"	825
340	"	-H	"	$-OCH_3$	"	"	"	"	"	835
341	"	"	"	$-NHCH_3$	"	"	"	"	"	835

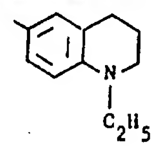
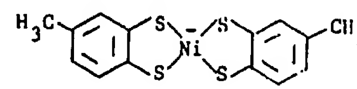
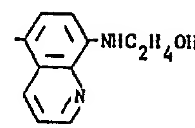
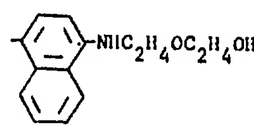
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
342	$-C_2H_5$	-H	-H	-Br	-H	-H	-H			860
343	"	"	"	"	"	"	"		"	875
344	"	"	"	"	"	"	"		"	855
345	"	"	"	"	"	"	"		"	875

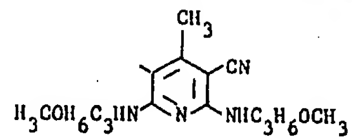
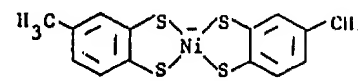
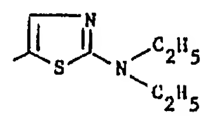
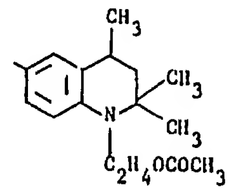
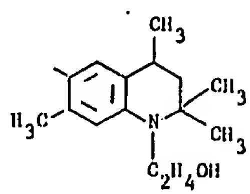
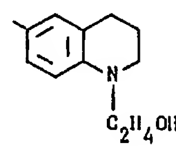
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
346	$-C_2H_5$	-H	-H	-Br	-H	-H	-H			875
347	"	"	"	"	"	"	"		"	865
348	"	"	"	"	"	"	"		"	820
349	"	"	"	"	"	"	"			855
350	"	"	"	"	"	"	"		"	870

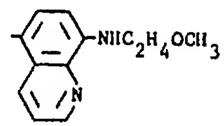
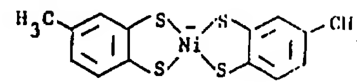
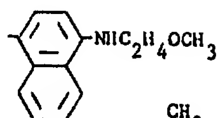
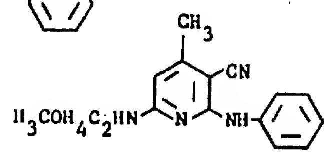
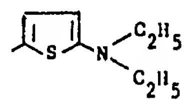
(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
351	$-C_2H_5$	-H	-H	-OH	-H	-H	-H			850
352	"	"	"	$-NH_2$	"	"	"		"	875
353	"	"	"	$-NHC_2H_5$	"	"	"		"	875

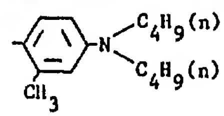
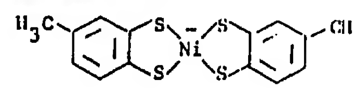
(cont'd)

Example No.	-R	-A^1	-A^2	-A^3	-B^1	-B^2	-B^3	-K	Z^-	λ max (coating film) (nm)
354	$-C_2H_5$	-H	-H	$-NHCOCH_3$	-H	-H	-H			855
355	"	"	"	$-N(COCH_3)_2$	"	"	"		"	825
356	"	"	"	-Br	"	"	"		"	818
357	"	-Br	"	"	"	"	"		"	875
358	"	"	"	"	-Br	"	"		"	845

(cont'd)

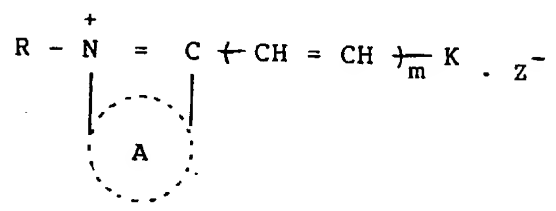
Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating Film) (nm)
359	$-C_2H_5$	-Br	-H	-Br	-Br	-H	-Br			860
360	"	"	"	$-CH_3$	"	"	"		"	860
361	"	"	"	$-C_2H_5$	"	"	$-C_2H_5$		"	840
362	"	-H	"	-H	-H	"	-H		"	830

(cont'd)

Example No.	-R	$-A^1$	$-A^2$	$-A^3$	$-B^1$	$-B^2$	$-B^3$	-K	Z^-	λ max (coating film) (nm)
363	$-C_2H_5$	-H	-H	-SCN	-H	-H	-H			835
364	$-C_3H_7(n)$	"	"	"	"	"	"	"	"	835
365	$-C_4H_9(n)$	"	"	"	"	"	"	"	"	835

Claims

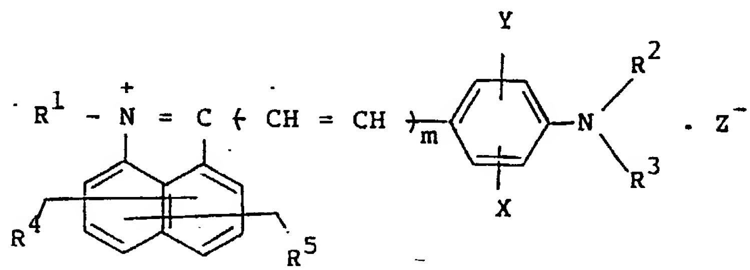
1. An optical recording medium comprising a support having provided thereon a recording layer containing a naphtholactam dye represented by formula (I):



(I)

wherein K represents a substituted or unsubstituted aromatic amine residue; R represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted allyl group; Z^- represents an anion; ring A represents a substituted or unsubstituted naphthalene ring; and m represents 1 or 2.

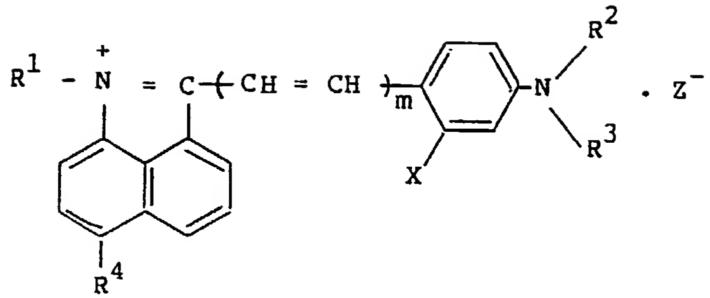
2. An optical recording medium as in claim 1, wherein said naphtholactam dye is a compound represented by formula (II):



(II)

wherein X and Y each represents a hydrogen atom, a halogen atom, an alkyl group, an acylamino group, or an alkoxy group; R^1 represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted allyl group; R^2 and R^3 each represents a hydrogen atom, a substituted or unsubstituted alkyl group having up to 20 carbon atoms, a substituted or unsubstituted aryl group, a substituted or unsubstituted allyl group, or a substituted or unsubstituted cycloalkyl group; R^4 and R^5 each represents a hydrogen atom, a halogen atom, a cyano group, a thiocyanate group, an alkyl group having up to 10 carbon atoms, an alkoxy group having up to 10 carbon atoms, an alkylamino group, an acylamino group, an amino group, or a hydroxyl group; Z^- represents an anion; and m represents 1 or 2.

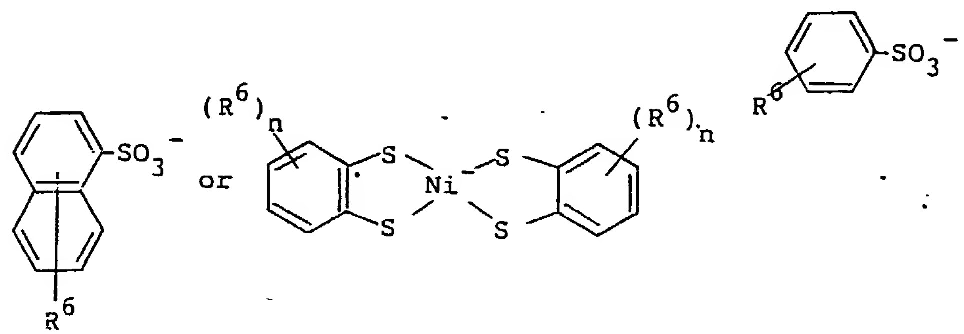
3. An optical recording medium as in claim 1, wherein said naphtholactam dye is a compound represented by formula (III):



(III)

wherein X represents a hydrogen atom or a methyl group; R^1 represents an alkyl group having up to 8 carbon atoms, an alkoxyalkyl group, an allyloxyalkyl group, an allyl group, or a hydroxyalkyl group; R^2 and R^3 each represents an alkyl group having up to 8 carbon atoms, an alkoxyalkyl group, an alkoxyalkoxyalkyl group, an allyloxyalkyl group, an allyl group, a hydroxyalkyl group, or a halogenoalkyl group; R^4 represents a hydrogen atom, a halogen atom, or a thiocyanate group; Z^- represents an anion; and m represents 1 or 2.

4. An optical recording medium as in claim 1, 2 or 3, wherein the anion as represented by Z^- is I^-, Br^-, Cl^-, ClO_4^-, BF_4^-, SCN^-, PF_6^-, SiF_6^-, TiF_6^-,



, wherein R^6, which may be the same or different when multiple R^6s are substituted, represents a hydrogen atom, an alkyl group having up to 6 carbon atoms, a halogen atom, or a dialkyl amino group; and n represents 0 or an integer of from 1 to 3.

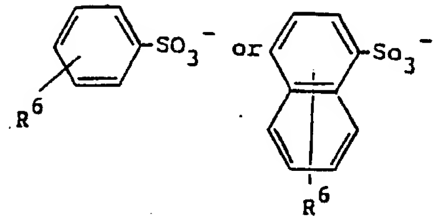
5. An optical recording medium as in claim 3, wherein R^1 is an alkyl group having up to 5 carbon atoms, an alkyl group having up to 5 carbon atoms which is substituted with an alkoxy group having up to 4 carbon atoms, an allyloxy group, or a hydroxyl group, or an allyl group.

6. An optical recording medium as in claim 3, wherein R^2 and R^3 each is an alkyl group having up to 8 carbon atoms, an alkyl group having up to 8 carbon atoms which is substituted with an alkoxy group having up to 4 carbon atoms, an alkoxyalkoxy group having up to 4 carbon atoms, an allyloxy group, a hydroxyl group, or a halogen atom, or an allyl group.

7. An optical recording material as in claim 3, wherein R^4 is a hydrogen atom, a chlorine atom, a bromine atom, or a thiocyanato group.

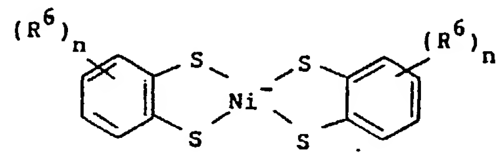
8. An optical recording medium as in claim 1, 2 or 3, wherein Z^- is I^-, Br^-, Cl^-, ClO_4^-, BF_4^-, SCN^-, PF_6^-, SiF_6^- or TiF_6^-.

9. An optical recording medium as in claim 1, 2 or 3, wherein Z^- is



wherein R^6 is a hydrogen atom, or an alkyl group having up to 4 carbon atoms.

10. An optical recording medium as in claim 1, 2 or 3, wherein Z^- is



wherein R^6, which may be the same or different when multiple R^6s are substituted, represents a hydrogen atom, an alkyl group having up to 4 carbon atoms, a chlorine atom, or a dialkyl group having up to 4 carbon atoms; and n represents 0 or an integer of from 1 to 3.

11. An optical recording medium as in claim 10, wherein Z^- is